

WANTED COPY.

Historical Society

VOL. 31

NO. 21

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K.S.A.C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K.S.A.C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D.V.S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I.T.U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K.S.A.C.).....	Secretary
JACOB LUND, M.S. (K.S.A.C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K.S.A.C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University)...	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K.S.A.C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K.S.A.C.).....	Instructor in English
Walter E. Mathewson, B.S. (K.S.A.C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K.S.A.C.).....	Assistant in Music
William Anderson, B.S. (K.S.A.C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoemsmith, B.S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K.S.A.C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K.S.A.C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K.S.A.C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K.S.A.C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H.C.A. & M.A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K.S.A.C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K.S.A.C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K.S.A.C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B.S. (K.S.A.C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K.S.A.C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K.S.A.C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B.S. (K.S.A.C.).....	Executive Clerk
Miss Alice M. Melton, B.S. (K.S.A.C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K.S.A.C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.



VOL. 31. MANHATTAN, KAN., FEBRUARY 18, 1905. No. 21

CORN BREEDERS' ASSOCIATION MEETING.

An increase of one bushel per acre in the Kansas corn crop would mean an increase of about 8,000,000 bushels, which might be valued at approximately \$2,000,000. That the average yield of corn in Kansas may be increased by selection and improvement of the seed and by better methods of culture cannot be questioned. In view of securing such an improvement, the Farm Department of the Kansas State Agricultural College, working in conjunction with the Corn Breeders' Association, has undertaken to inaugurate a series of annual corn shows and corn-judging and corn-growing contests. The first corn show and the first program of the Corn Breeders' Association will be held at Manhattan, March 2 to 4, 1905.

Some of the most eminent plant breeders and corn growers of this country have been secured to address the association on these subjects, and it is hoped that everyone interested in corn will be present. Bring a dozen ears of corn which represent as nearly as possible your idea of good corn, and compare the same with corn brought from the adjoining county and other parts of the State.

The following prizes have been offered in the various contests:

STUDENTS' JUDGING CONTESTS.

CLASS A.

	First prize.
Senior students.....	\$5.00
Junior students.....	5.00
Sophomore students.....	5.00
Freshman students.....	5.00
First-year short-course students.....	5.00
Second-year short-course students.....	5.00
Special students.....	5.00

Open to five students from each of the above classes, the students in each class competing with each other, but not with students of any other class.

CLASS B.—Sweepstakes.

First prize, Chatham fanning and bagger attachment, donated by the Manson Campbell Company, Detroit, Mich.

Second prize, Tower surface cultivator, donated by J. D. Tower & Sons Company, Mendota, Ill.

Third prize, Acme harrow, donated by Duane H. Nashe, Millington, N. J.
Open to all students entered in Class A, all competing with each other.

CLASS C.

The Fielding Trophy will be given for one year to the class whose team scores the highest.

CLASS D.—Essay Contest.

A Victor planter, which was donated by the Fuller and Johnson Manufacturing Company, Madison, Wis., will be given for the best essay on the subject, "Planting Corn."

Open to all students of the Agricultural College, and to all who are growers of corn in Kansas.

CLASS E.—Corn Growing Contests.

(For the best ten ears of yellow corn.)

First prize, Plano mower, donated by the International Harvester Company, Chicago, Ill.

Second prize, Kingman "No Tip" cultivator, donated by Kingman-Moore Implement Company, Kansas City, Mo.

Third Prize, two-by-six foot galvanized steel stock tank, donated by the Demster Mill Manufacturing Company, Beatrice, Neb.

CLASS F.

(For the best ten ears of white corn.)

First prize, Black Hawk planter, donated by the D. M. Sechler Carriage Company, Moline, Ill.

Second Prize, Emerson No. 26 cultivator, donated by the Emerson-Newton Company, Kansas City, Mo.

Third prize, Acme harrow, donated by Duane H. Nashe, Millington, N. J.

CLASS G.

(For the best ten ears of corn, any other variety.)

First prize,———

Second prize,———

Third prize,———

It has not yet been determined what the prizes in this class shall be, but they will doubtless be of equal value to those of classes E and F.

CLASS H.

(For the largest yield of corn, any variety.)

First prize, Tricycle lister, donated by the Rock Island Plow Company, Rock Island, Ill.

Second prize, Six bushels Hildreth corn or \$15 cash, donated by C. E. Hildreth, Altamont, Kan.

RULES GOVERNING THE CONTESTS.

ESSAY CONTEST.

1. All contestants in Class D shall send their applications to the professor of agriculture, Kansas State Agricultural College, Manhattan, Kan., by May 1, 1905.

2. Each essay shall contain not less than one thousand nor more than two thousand words.

3. Each essay shall be typewritten and three duplicate (carbon) copies made, the original copy to become the property of the Farm Department, and the others to be sent to the three judges.

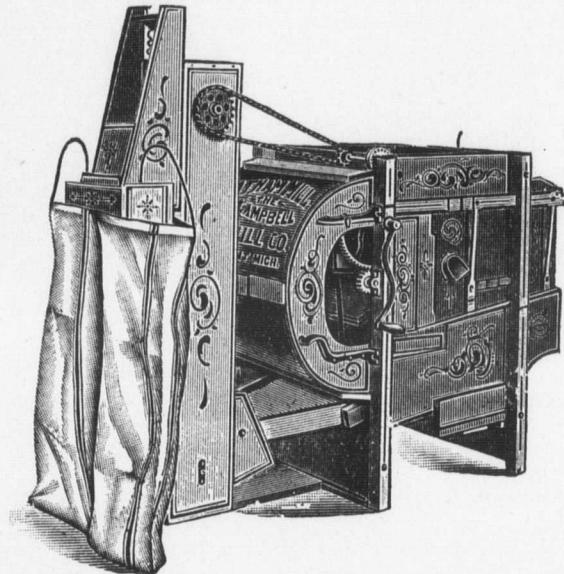
4. Three judges shall be appointed to award the prize, none of whom shall be connected with the College in any capacity. One

judge shall be chosen by the President of the College, one by the Professor of Agriculture, and one by the company offering the prize.

5. The judges in awarding the prize shall base their decision as follows: The thought of the essay as related to the subject discussed shall count eighty points; the literary merit and grammatical construction shall count twenty points.

6. All essays must be in possession of the professor of agriculture, Kansas State Agricultural College, by June 13, 1905.

7. The essays shall not be signed, but shall be placed in a large envelope in which shall also be placed a sealed envelope containing the name of the author, and the large envelope shall be addressed to the professor of agriculture, Kansas State Agricultural College, Manhattan, Kan., who shall mark the same number upon the envelope and upon all the essays received with it, such number to be the means of identification of the essay after the decision of the judges has been received.



Chatham Fanning Mill and Bagger Attachment, to be awarded in Class B. Presented by the Manson Campbell Co., Detroit, Mich.

CORN-GROWING CONTESTS.

1. All samples of corn exhibited for prizes shall become the property of the Farm Department of the Kansas State Agricultural College.

2. No exhibitor shall make more than one entry in any class.

3. The corn exhibited in Classes E, F and G must have been grown by the exhibitor in 1905.

4. All entries for Classes E, F and G must be made by a certain date in the winter of 1905-06, as shall be determined by the Farm Department.

5. All entries in Class H shall be made by September 1, 1905. The yield of corn shall be determined by a measured acre of land, and one bushel of ears which shall be a fair sample of the corn

produced on the acre shall be sent to the Farm Department of the Kansas State Agricultural College, together with the weight as determined on the same day as the remainder of the corn is weighed. All the above measurements, weights, etc., shall be

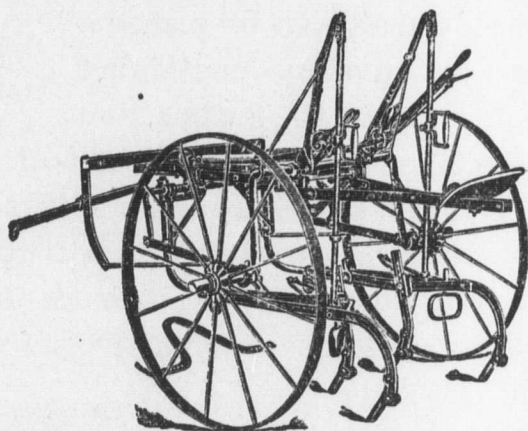


Demster Galvanized Steel Tank, to be awarded in Class E.
Presented by the Demster Mill Mfg. Co.,
Beatrice, Neb.

made by some competent person appointed by the Farm Department, with the assistance of the owner of the corn, both of whom shall make affidavit that all measurements, weights, and everything connecting them with the contest

is fair and according to the rules of the contest, to the best of their knowledge and belief. The Farm Department shall make determinations of the percentage of moisture in all samples sent in, and all yields shall be figured to an equivalent yield containing fifteen per cent of moisture, as representing air-dry corn.

6. Each contestant in class H shall furnish a written statement of the kind of soil upon which his corn was grown, kinds and amounts of fertilizers and manures used, methods of planting and cultivation, and other data which may be of general interest.



Emerson Cultivator, to be awarded in Class F.
Presented by the Emerson-Newton Co.,
Kansas City, Mo.

KANSAS CORN BREEDERS' ASSOCIATION.

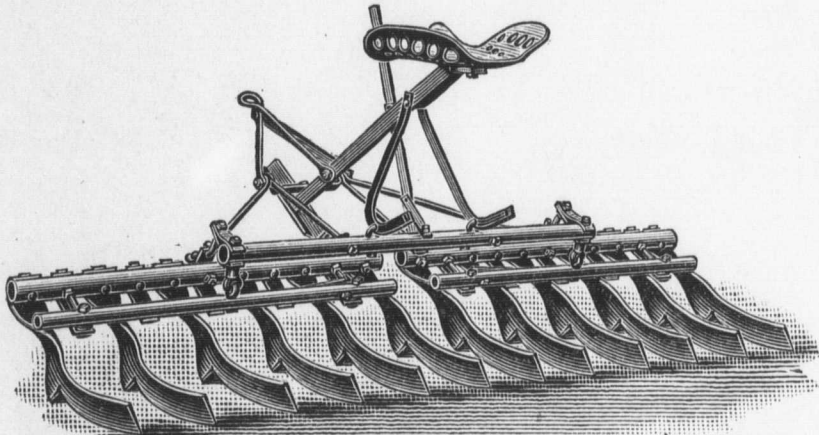
Organized January 9, 1902.

OFFICERS.

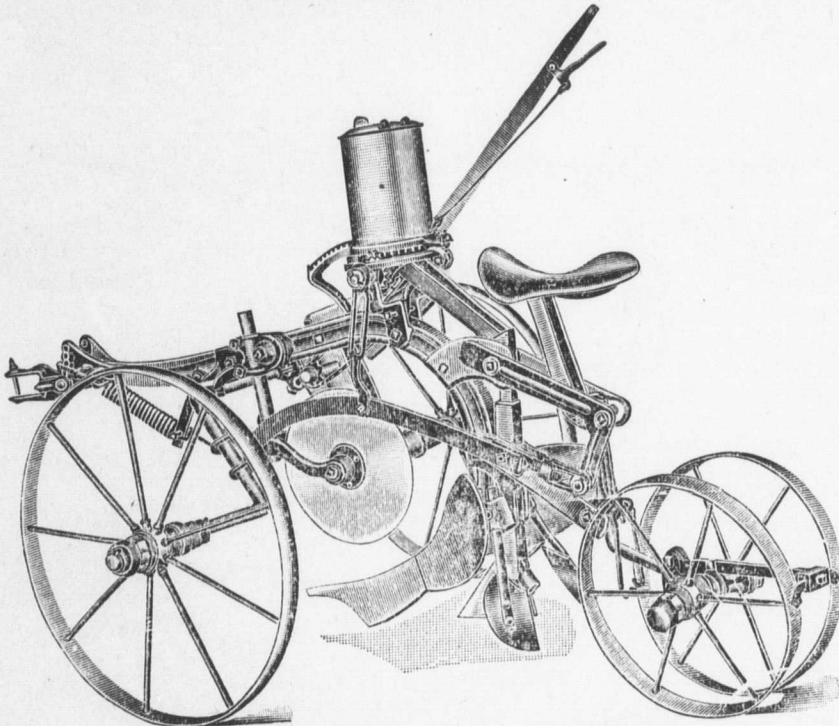
President.....	J. W. Robison.....	El Dorado
Vice-President.....	Edwin Taylor.....	Edwardsville
Secretary.....	V. M. Shoesmith.....	Manhattan
Treasurer.....	Guilford Dudley.....	Topeka

DIRECTORS.

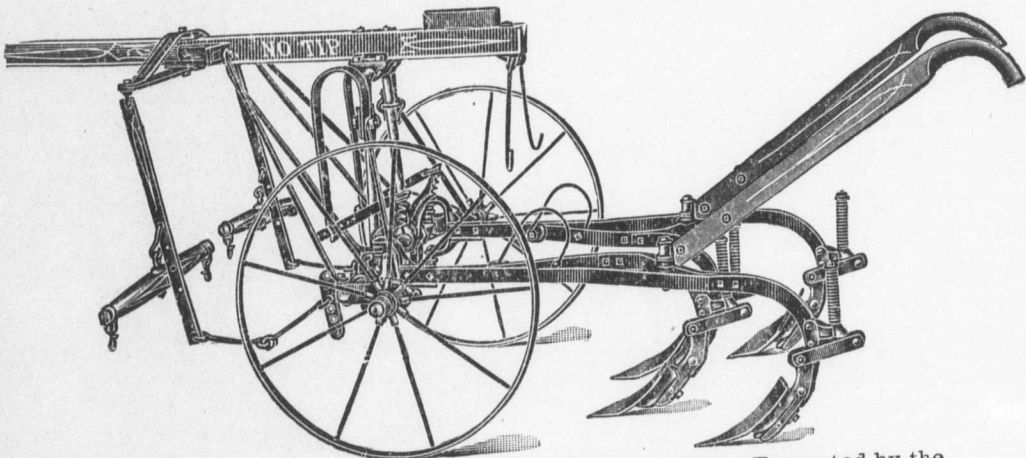
J. W. Robison, El Dorado.	Edwin Taylor, Edwardsville.
V. M. Shoesmith, Manhattan.	Guilford Dudley, Topeka.
T. M. Potter, Peabody.	E. B. Cowgill, Topeka.
Prof. A. M. Ten Eyck, Manhattan.	



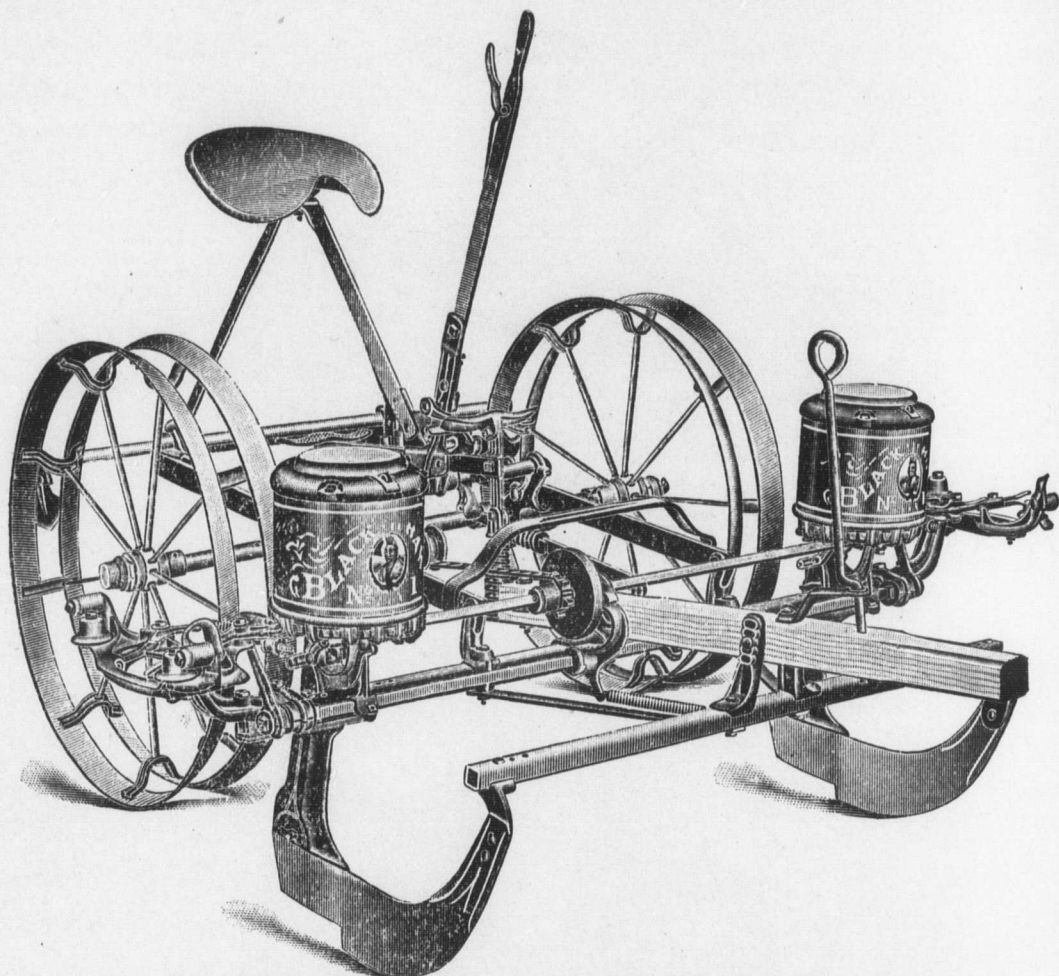
Acme Harrow, to be awarded in Classes B and F. Presented by Duane H. Nashe, Millington, N. J.



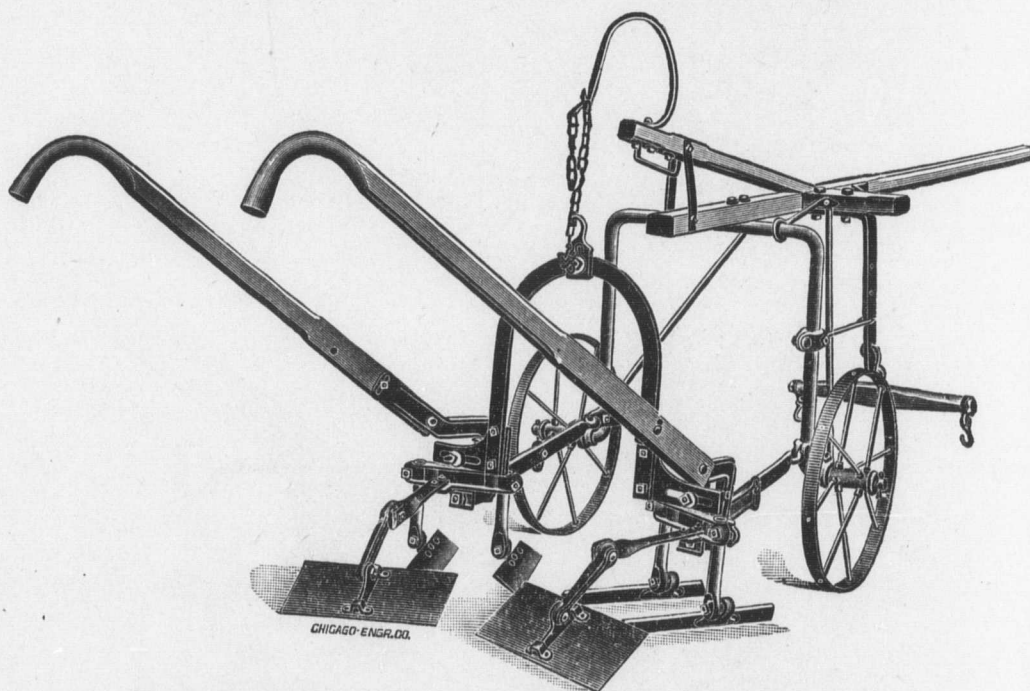
Tricycle Lister, to be awarded in Class H. Presented by the Rock Island Plow Co, Rock Island, Ill.



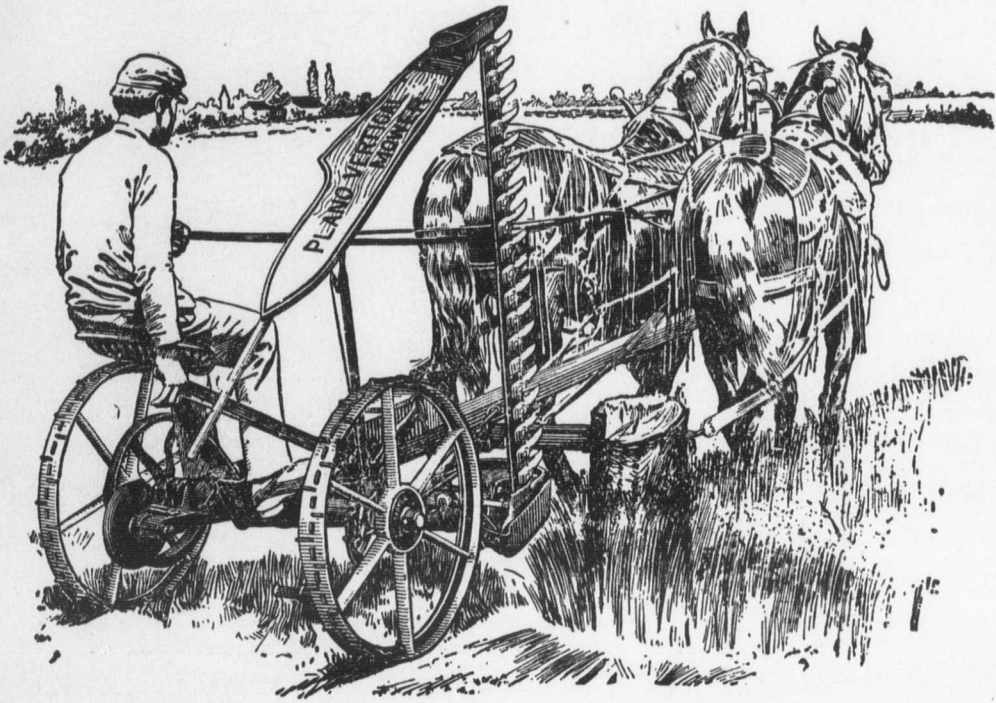
Kingman "No Tip" Cultivator, to be awarded in Class E. Presented by the Kingman-Moore Implement Co., Kansas City, Mo.



Black Hawk Planter, to be awarded in Class F.
Presented by the D. M. Sechler Carriage Co., Moline, Ill.



Tower Surface Cultivator, to be awarded in Class B. Presented by
the J. D. Tower & Sons Co., Mendota, Kan.



Plano Mower, to be awarded in Class E. Presented by the International Harvester Co., Chicago, Ill.



Victor Planter, to be awarded in Class D.
Presented by the Fuller and Johnson Mfg. Co., Madison, Wis.

PROGRAM

KANSAS CORN-BREEDERS' ASSOCIATION MARCH 2 to 4, 1905.

Thursday Evening Session.

Music.

Science in Agriculture Pres. E. R. Nichols
Breeding to Improve the Quality of Corn Dr. Herbert J. Webber
United States Department of Agriculture, Washington, D. C.

Friday Morning Session.

Agriculture in Alaska Supt. P. H. Ross
In charge of Government Experiment Station, Kenai, Alaska.
Special Requirements for Corn Growing in Western Kansas H. Myers
Hutchinson, Kan.
My Experience in Breeding Corn Pres. J. W. Robison
El Dorado, Kan.

Friday Afternoon Session.

Music.

Intensive Farming Arnold Martin
Duboise, Neb.
Corn Growing Col. Guilford Dudley
Topeka, Kan.
Plant Adaptation Prof. A. M. Ten Eyck

Friday Evening Session.

Music.

Corn Improvement Dr. Geo. M. Tucker
Blodgett, Mo.
Manager of the Tucker Plant-breeding Farm; formerly Agriculturist of Missouri Experiment
Station.

Saturday Morning Session.

Business Session.

Study of Samples of Corn in Corn Show.

Saturday Afternoon.

Students' Corn-judging Contest.

POOR-FARMS AS EXPERIMENT STATIONS.

Mention was made in the *INDUSTRIALIST* last week relative to the plan of the Farm Department to undertake some experiments in the growing of crops in coöperation with the county poor-farms in different parts of the State. Such a plan has been proposed and the Farm Department is preparing samples of seeds for this purpose. However, no definite arrangements have been made by which these experiments shall be carried out.

The purpose is to introduce a bill in the present legislature, authorizing the counties to undertake experiments at the county poor-farms in coöperation with the State Experiment Station. The originator of this bill is Mr. E. W. Albright, one of the students in the short course, whose home is near Brewster, Kan. He is working with some of the western representatives and has gathered information and has been largely instrumental in preparing the bill which will presently be introduced into the legislature.

Anticipating the passage of such a bill, the Farm Department is making the preparations noted above, and letters of inquiry have been addressed to the superintendents of the poor-farms all over the State relative to their equipment and fitness to undertake crop experiment work. The Station will be able to coöperate with only a limited number of counties during the coming season, as no provision has been made for this work and no funds will be available until after July 1, providing the legislature passes the measure introduced.

This measure is heartily favored by the Station Council and the members of the Board of Regents and seems to meet with the approval of the farmers all over the State. Such a plan has already been partially introduced in Iowa, although in that state no act has been passed by the legislature giving the counties authority to engage in experimental work. Such work is being carried on, however, in Iowa at the option of the counties and the state experiment station.

It is very desirable that experiments be undertaken in different parts of the State in testing the adaptability of the different varieties of the standard crops to different soils and climatic conditions. At this Station, in 1903, "standard" varieties of corn varied in yield from thirty to eighty-nine bushels per acre, when grown in the same field and under exactly the same conditions,

indicating a wide difference in varieties in their adaptation for growing at this Station. Another desirable phase of this coöperative experiment work will be the introduction of new varieties of grains, grasses, etc., and the breeding by careful selection of crops better adapted for growing in the different sections of the State. Altogether the plan offers great opportunity for great improvement in the production of crops, and experiments carefully planned and carried out for a series of years will result in larger average yields of the standard crops grown in the State and will eventually add materially to the financial prosperity of Kansas. The plan should receive the hearty support of every one interested in the welfare of Kansas.

It is important to note here that H. M. Cottrell, formerly professor of agriculture at this College, urged the undertaking of crop experiments at the county poor-farms several years ago. In the issue of the *INDUSTRIALIST* of December 25, 1900, in an article on this subject he says, after discussing the necessity and value of such work:

"Most of the counties of the State maintain county poor-farms. These farms are usually situated so that work on them can conveniently be observed by most of the citizens of the county in which they are situated. Why not utilize these farms for conducting field experiments? . . . A change in the law may be necessary to enable the county commissioners to carry on such work on the poor-farms, and provision would have to be made to pay traveling expenses of Experiment Station men when called to visit these farms. This plan seems to the writer to offer a practical and cheap method of bringing quickly the field work of the Experiment Station directly to the farmers' own localities, and promises to save the enormous expense now made necessary by every farmer making experiments at his own expense."

In this connection it may be added that this article was quoted in part and received some favorable comment in *Wallace's Farmer*, of Des Moines, Iowa, and the suggestion appears to have been taken up by the Iowa Experiment Station, resulting in the coöperative experiments which are now being carried on at many of the county poor-farms of that state, and which seem to be proving a success and are receiving the high appreciation of Iowa farmers.

A GOOD INVESTMENT.

A Large Appropriation for the State Agricultural College and Experiment Station.

I have been an interested observer of the movement for a State oil refinery, and I heartily favor its establishment. The main objection to it seems to be its first cost. But what does it matter about the first cost or a little higher taxes if by means of the appropriation the money comes back to the people of the State in a cheaper product of better quality.

Again, what valid reason can be given for limiting the appropriation to the Kansas State Agricultural College and Experiment Station to the bare necessities of that institution? The wealth of Kansas is in her soil; the soil is her bank account, and the deposit is being rapidly exhausted by wasteful methods of farming. Can the State lose anything by teaching her young men how to farm more scientifically and intelligently in order to produce the largest crops and yet maintain the fertility of the soil and not reduce the bank account for coming generations? And can the money contributed by the tax payers of the State be invested to any better advantage than to supply sufficient funds to properly maintain a great State Experiment Station which shall attempt to solve the many difficult agricultural problems of this State, with its varied climate and soil and many lines of agriculture?

It is not my purpose here to enter upon a discussion of the work which our Experiment Station has accomplished. Enough to observe that it has conducted experiments, the results of which have added greatly to the wealth and importance of our State. The Experiment Station was largely instrumental in introducing alfalfa and Kafir-corn as profitable Kansas crops, and alfalfa is revolutionizing the agriculture of this State, for by its culture we are not only solving the problems of economic stock feeding, but by a proper use of alfalfa in rotation with other crops we shall be able to maintain and even increase the fertility of our soil. More recently the Station has been introducing and testing grasses, and the *Bromus inermis* introduced as the result of these tests is solving the question of a domestic grass for central and western Kansas, and thus from this College and Experiment Station has radiated that force, *Agricultural Education*, which has not only permeated every part of our great State, but its influence has reached beyond the boundary lines into other states and territories. The power of education added to the pluck and native ability of

Kansas farmers has built up and made our agricultural industries what they are to-day and has placed Kansas agriculture on the strong foundation of prosperous growth which it occupies. But this progress has only begun. The opportunities for improvement are still great. There are greater problems yet to solve than have been solved. The studies of the great problem of "soil culture" for western crop production are yet in their infancy. In this great central West we have done little or nothing along the line of breeding crops, and recent experiments show that plant breeding is just as practicable and just as important as the breeding of animals.

Wonderful results are being secured in this *new* field of plant breeding and seed selection. The statement is being published through the agricultural press that "Iowa nearly doubled her corn crop last year by the use of properly selected, cured and cared-for seed," and what Professor Holden has done for corn in Iowa can be done by the workers in our Experiment Station, not only for corn in Kansas, but in like proportion for every other crop grown in this State. It is just as practicable to breed wheat, oats, barley, Kafir-corn and alfalfa as it is to breed corn, and the results will be as remarkable and as valuable, relatively, as the results of corn breeding. The Kansas State Agricultural College and Experiment Station has just as capable men to undertake the solution of these problems as may be found in any other similar institution in the United States. Allow us more funds, grant us a larger number of assistants, and give us more time to work on these problems if you would see the greatest results.

There is no other agricultural college in the United States that accomplishes so much with so little. As shown by President Nichols' report for 1904, no other institution in the country, comparable with ours, educates its students at so small an average cost or employs, relative to the number of students taught, so small a teaching force.

"The University of Illinois is asking the legislature of that state for \$1,000,000 for her agricultural schools alone." In this State, in which the prosperity of the people depends almost wholly upon agriculture, can we conceive of an investment of a few hundred thousand dollars of the State's money that will accomplish greater good for the State than by the appropriation of a liberal sum for the Agricultural College and Experiment Station? A. M. TEN EYCK.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS..... Editor-in-Chief
PROF. J. D. WALTERS..... Local Editor
PROF. J. T. WILLARD..... Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD..... Ellsworth
HON. J. W. BERRY ['83]..... Jewell City
HON. J. O. TULLOSS ['99]..... Sedan
HON. GEO. S. MURPHEY..... Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

J. C. Cunningham, one of the seniors, will go in the spring to Nebraska, to superintend a large nursery.

Professor Valley sang a beautiful solo last Saturday morning before Chapel exercises. The students have asked him to do this often.

Professor Potter is directing the junior and senior engineering classes in the practical methods of armature winding. One of the old motors has been rewound and some others will be completed in the near future.

The Chemical Department has just completed the installation of a system of connections, switches and wiring for charging a storage battery and distributing current from either the battery or the dynamo to the lecture tables and laboratories, for use in all kinds of experimental work requiring electricity.

Prof. F. A. Metcalf, formerly professor of oratory at this College, is at present teaching elocution at the Westport high school, in Kansas City, Mo., and Prof. L. F. Paull, formerly assistant in botany at this College, is teacher of physiology and botany in the Kansas City Manual Training School, on Fifteenth and Tracy streets.

There will be no consolidation of the two student papers—the *Herald* and the *Jayhawker*—for the present. It seems that a merger might have been possible if the two parties of stockholders could have agreed on a name for the “twin.” When this question came up the previously adopted motions were rescinded, and as a result the papers will continue as before.

The present senior class numbers 109 students and is the largest in the history of the College. It is expected that at least a full hundred of these will pull through the remaining half-year, and thus once more give the College the largest graduating class in its history. Two years ago the graduates numbered 54; last year there were 99. Let's have a full hundred this spring.

Prof. P. J. Parrott sends substantial greetings to the *Republic* from Geneva, New York, where he fills the chair of entomology in the New York state experiment station. Mr. Parrott was one time assistant at K. S. A. C. and used to catch bugs around Manhattan, the same as many a boy is doing here these present years, whose hopes are still aspiring and who is destined to fill equally important stations along educational lines.—*Daily Republic*.

The cold weather of last week caused the freezing of the radiator in Professor Walters' studio. When he came into the room in the morning, the radiator was still filled with an ice core and had cracked open in two places along the base. Engineer Lund replaced the broken "heater" in a few hours. Considerable damage was done to the water-pipes in some of the buildings by the excessively cold weather, and it was impossible to keep some of the class rooms warm enough for recitations.

Dr. J. R. Moechel, of Kansas City, Mo., paid the College and especially the Chemical Department a brief visit last week. He was much interested in what he saw and, like most of those who visit us for the first time, found the institution of much wider scope and greater magnitude than he had anticipated. Doctor Moechel is probably the most eminent professional chemist in the Missouri river valley. He, with Professor Willard, gave expert testimony in a liquor case on trial in Marysville on the 8th instant.

The members of the Faculty have been busy during the week grading examination papers and working out averages for the first half of winter term. The Faculty met on Wednesday and Thursday afternoons to consider low grades. There were a large number of these, but in a majority of cases the students were permitted to go on with their studies. The teachers are hoping that a clearer insight into fundamentals will come with further work and closer application on the part of the disciplined young people.

ALUMNI AND FORMER STUDENTS.

B. W. Conrad, '95, visited the College last week.

Professor Dickens has received an interesting letter from Fred Kimball, '87, who is spending the winter in Nome, Alaska. The people of that ice-bound camp are enjoying telegraphic communications with the world now by way of cable, land line, and wireless stations. He speaks of a Kansas man as owning the richest strike ever made in that country, from which he took \$35,000 in two or three weeks. Mr. Kimball is doing well in business on a more modest scale. He mentions the prosperity of the "Arctic Brotherhood," a fraternal order which seems to be interested in promoting the social pleasures of its members. It may be of interest to some to note that the Free Masons have a lodge at Nome in which the fee for membership is one hundred dollars.

COMING FARMERS' INSTITUTES.

Feb. 20, Belleville, Professor Erf and Assistant Shoemith;
Feb. 21-22, Rome, Professors Popenoe and Walters;
Feb. 22-23, Oneida, Professor TenEyck;
Feb. 27-28, Randolph, Professor Willard and Assistant Wheeler;
Mar. 1, Bucklin, Professors TenEyck and Erf;
Mar. 3, Sedan, Professor TenEyck;
Mar. 7, Frankfort, Professor Walters and Assistant Shoemith.

VOL. 31

NO. 22

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University)	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg) ..	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory)	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.)	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary.
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.) ..	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School)	Assistant in Drawing
Vernon M. Shoesmith, B. S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.)	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B. S. (K. S. A. C.)	Executive Clerk
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., FEBRUARY 25, 1905.

No. 22

PRACTICAL QUESTIONS ON FARM MANAGEMENT.*

THE study of farm management having been introduced into the agricultural course of the Kansas State Agricultural College, it was decided by Prof. A. M. Ten Eyck, who has this branch of study in charge, that some of the methods of farm management employed by the farmers over the State, and by the farmers of other states, might be studied with advantage, providing that the plan of the methods employed could be secured. With this object in view the names of prominent farmers were sought and procured, both in this State and in other states. The 1904 class in this subject, acting with the professor, then made up a list of questions, which were submitted to the farmers for answer.

This list of questions was sent to nearly two hundred farmers, with a letter explaining the purpose of the investigation, and requesting careful and concise answers. As a result, in the neighborhood of fifty of the men addressed answered the questions more or less fully. I was appointed by Professor Ten Eyck to work up the data secured, and I have sought to put the answers into a form so that their contents may be noted easily. Such answers should be of value and interest to farmers generally, as showing the methods whereby some men out of the many engaged in agriculture throughout the United States have carried on their farming business successfully, and by successfully I mean profitably. Below is given, in a condensed form, the answers received from three states—Kansas, Wisconsin, and North Dakota. For convenience the question is stated each time, followed by the answers, and the data has been grouped by states.

Questions and Answers in Farm Management.

ANSWERS GIVEN BY KANSAS FARMERS.

1. What line of farming are you engaged in?

*Graduation thesis, prepared under the direction of the Farm Department, Kansas State Agricultural College, by L. A. Doane.

Answer—Thirteen stock, fourteen general, one grain.

J. M. Moody.—Seed growing and stock raising.

John Thrall.—Raising seed corn, pop-corn, beans, and potatoes.

Three who said that they were engaged in mixed farming also stated that they were feeding all their produce to stock raised, so that this would be practically stock raising too.

2. Do you take an inventory of your property each year, so that you may know the value of your investment and your annual profit or loss?

Ans.—Twelve, no; sixteen, yes.

3. Do you keep a careful account of all business transactions?

Ans.—Six, no; twenty-three, yes.

J. P. Wood.—Only as cash is involved.

4. Do you keep daily work records?

Ans.—Twenty-four, no; four, yes.

Two different men had started to keep records, but had given it up.

John Thrall.—Write up records carefully each day.

J. A. Showalter.—Not any more than what is paid for.

5. Do you keep account with each field or crop and with each department of your farming business?

Ans.—Twenty-two, no; seven, yes.

C. W. Taylor.—Keep accounts with each department but not with each field.

E. L. Cottrell.—I could not possibly do it.

6. Describe your system of keeping accounts.

Ans.—Mr. Reichenberger, who says no to question five, says he keeps day-books and ledger accounts.

A. J. Pottorf.—I know how many acres are in each field and also know yield and cost of labor in each and can easily compute profit or loss.

C. W. Taylor.—I have cut my system of keeping accounts so that it takes the least possible time. My check-book keeps my bank account and I do not keep any cash account. All the men I know who are running large farms and keep an accurate set of books are failures as farmers.

E. L. Cottrell.—I keep four different accounts: hogs, horses, cattle, and one for general farm expenses; close my books at end of each year after taking invoice.

Thos. Potter.—I pay out all funds by check and make record of transaction on stub, then copy this in day-book.

J. M. Moody.—I keep account of all expenses incurred, also of all the money taken, and at the end of each year balance accounts.

Edward M. Hall.—I keep personal accounts, like a ledger account, with explanations.

J. A. Showalter.—I have two books, day-book and ledger. In the day-book goes everything—all business transactions, time of seeding, etc., then I check out to my ledger what I want to sum up.

Unsigned.—Have not yet established a fixed method of keeping accounts. Have used a day-book and journal (combined) and ledger. Keep accounts (partly so) with live stock, dairy produce, poultry and eggs, fruit and vegetables, grain, cash, expense, personal accounts, loss and gain (double entry).

J. P. Wood.—Impossible.

D. G. Page.—All accounts are lumped in the general ledger.

E. E. Chase.—I have no system; as yet few accounts.

C. W. Shull.—Thus far I have just kept a day-book, from which I make up special accounts as I wish them.

J. B. Harman.—I keep a cash book and a ledger account with some. I record a cash deal in this way:

To McLoad, 7 hogs, average 250 pounds, at 5 cents....	\$87.50
By Fariae, 2 cows at \$35.00....	70.00

L. W. Waldraven.—My method of keeping accounts is simply a set of three books—one for daily record and work book, one for business accounts; (do not follow intricate rules of bookkeeping), and one for ledger accounts.

P. K. Symns.—Detailed itemized accounts with date in book and a complete file of bills and receipts.

A. L. Noyes.—I itemize all sales, also all money paid to hired men, with the dates. I also take down the date when each mare is bred and state as to what horse or jack, as the case may be. Any farther questions that may come up, I can generally answer from these dates and from memory, my check book also helps.

W. R. Correll.—I do all business through the bank. Pay all labor, notes, etc., by checks. Check answers for receipt. Keep a rough farm day-book and copy into ledger only after a series of business transactions. Do not have any regular time to transfer accounts.

George Doll.—My books I keep are day-books and large and

small ledgers. The accounts opened are: wheat, corn, oats, Ka-fir-corn, horses, cattle, hogs, implements, repairs, etc.

7. Do you prefer married or single men as farm hands?

Ans.—Thirteen, single; eight, married. Two had their own boys; one had no preference.

W. H. Rhodes.—Have had no experience with married men; single men are very unsatisfactory.

J. A. Showalter.—My experience teaches me that a single man makes the best farm hand, as married men who hire out on the farm have very little ingenuity, get up, etc., or they would not be hiring out.

J. A. McKenzie.—I think single men better workers; married men more steady.

8. What is your method of handling hired help?

Ans. G. F. Wagner.—If possible treat them as members of my family and expect them to do accordingly.

John Thrall.—Of recent years have worked in field ten hours and done chores outside of this time.

A. J. Pottorf.—I work with hired man and can judge when he has done a day's work, treat him like a white man, pay him good wages and that promptly.

A. M. Reichenberger.—I pay good wages, treat them kindly, and have no trouble with them.

E. L. Cottrell.—Treat them as I would have an employer treat me, and turn them off as soon as I can get along without them if they do not appreciate my treatment of them; otherwise keep them as long as they will stay.

E. M. Hall.—“Feed them well and work them well.”

J. P. Wood.—Usually treat them as one of us.

C. J. Reid.—If a single man; take him into the family and make his stay as comfortable as possible and expect him to do the heavier part of the work; pay him by the month. If married man, pay him by the day and he boards at home.

J. B. Harman.—Treat them as you would like to be treated under like circumstances, and if they abuse your confidence, discharge them as soon as you can do better.

P. K. Symns.—Good pay, expect careful, thorough work for reasonable time, and make him feel at home.

A. L. Noyes.—At present time I have a contract with a man for a year. He is to give me practically all of his time, I furnish

him house and garden spot, he boards himself. I oversee the work personally whenever I can. To supplement my regular work I sometimes hire boys by the day or month.

W. A. Coe.—Have not hired much help yet.

W. R. Correll.—Treat him as near like one of the family as he will permit. Require ten hours work and no more with team. Keep the same team, harness and man together the summer through as near as I can; each man has charge of his own team. Use riding tools when possible. Have never had definite time to pay help except on contract jobs; pay when demanded.

9. What is your method of handling and caring for farm machinery?

Ans.—Fourteen said they had sheds.

E. L. Cottrell.—I have no method up to date, but try to keep everything repaired before time to use it. Have my blacksmithing done in winter time, when the blacksmith is not busy; get better work done and think I get it done cheaper.

C. W. Taylor.—I always get implements repaired as soon as through using them, oil well and put in shed.

J. A. Showalter.—Keep sheltered if possible, but more important than that, "know the machine" and repair in winter; never attempt to use a machine not in shape or on the point of breaking down.

Unsigned.—Aim to put machinery in shelter when through using (repairing if necessary, before putting away).

J. P. Wood.—When not in use I like wooden parts in sheds and keep the mold-boards of my plows greased with a mixture of some kind of paint and machine oil, so that they will not rust.

C. W. Shull.—Generally speaking, I will say that our dry climate does not appreciably deteriorate machinery standing out during months it is not in use. Most of the machinery used here is not housed. My plan is to house the most delicate iron parts of the machinery, and practically all wooden parts.

L. W. Waldraven.—It is our custom to make a machine do its required work with proper treatment. Such implements as plows and disks, I always give a thorough application of axle grease. We keep a well-equipped blacksmith and repair shop on the farm and keep the machinery in good order. I believe in keeping machinery well oiled and cleaned. I put my expensive machinery in the shed the day I finish work.

P. K. Symns.—Keep in repair while in use, shelter while idle, when season is over clean up and repair, oil and store ready to begin next season's work.

W. R. Correll.—Use best oil obtainable; keep all bearings tight. Aim to keep under sheds, paint shovels, plows, listers, etc., when put away.

10. What per cent do you allow each year for the depreciation in value of farm machinery?

Ans.—Nine, 10 per cent; five, 15 per cent; one, 20 per cent; one from 25 to 33 per cent.

C. W. Taylor.—I estimate each piece of machinery when I invoice. It depends upon the party who uses the machine. Some men will use a machine five years, and others will only use it one.

Edwin Taylor.—Do not be afraid to send the machine to the scrap pile; it is cheaper to buy new machinery than to repair.

11. Do you practice a definite system of crop rotation? What is your plan?

Ans.—Fifteen, no; seven, yes.

C. W. Shull.—No, not to any extent, but speaking from observation will say that barley generally follows sorghum, Kafir-corn or corn. Our most progressive people here are adopting the Campbell system.

L. W. Waldraven.—We always practice crop rotation thus far. We raise three crops, principally corn, oats, wheat and rye. We leave stalks standing in the field and the following year plow and sow to oats. In the fall, plow oat stubble for wheat. Corn two years, oats one year, and wheat or rye one year.

W. H. Rhodes.—What I have in corn this year I put in oats and other small grains next year.

A. J. Pottorf.—I do. Corn-stalk ground is sown to oats, the oat stubble is plowed in the summer and sown to wheat in the fall, the wheat stubble is mowed if noxious weeds are plentiful, and if not the mower is not used. The following spring this ground is listed to corn. This is the way we raise our biggest corn. A field treated in this way will make sixty bushels per acre this year.

A. M. Reichenberger.—Corn land followed by oats and wheat, aiming to run ground to oats one year, and about three years to oats and corn.

J. A. McKenzie.—No. Consider alfalfa in a long rotation, eight

to twelve years, the best for this section, or alfalfa four to six years, then a period of cultivated crops.

Frank B. Buchli.—I practice crop rotation with a view of preserving and enriching the soil and getting best crops.

12. Do you feed the crops on the farm, or sell and remove them from the farm?

Ans.—Nine, do both; sixteen, feed all crops; two, sell nearly all crops.

J. M. Moody.—I sell my own crops of corn for seed, but buy feed, the same amount as was on the farm.

E. M. Hall.—Remove grain and hay and sell, but plow down the stalks; never burn trash or weeds.

A. J. Pottorf.—If grain is high and I do not think it will pay to feed, grain and stock are both sold; but if grain is cheap, I feed at home.

13. What is your method of saving and handling manure?

Ans.—Two, no method.

Unsigned.—Clean stables out and haul manure to the fields. Clean out feed lots in the spring.

J. P. Wood.—I haul from the stables and spread on wheat ground when possible, and haul from lots and spread on wheat when I can.

C. J. Reid.—All manure made in stables and sheds and open lots is hauled out as soon as made and immediately applied to the land. In winter the manure is applied to the corn stubble for succeeding crops, but the aim is to save and use all the manure.

E. E. Chase.—The manure from cow lot is scraped up and dumped on the land and spread by hand. The manure from the barns is forked on a low wagon and spread by hand.

J. B. Harrison.—Haul to the field as soon as made.

L. W. Waldraven.—We put out manure in heaps and haul it to fields in the latter part of the winter, before seeding time; also the summer manure we haul to the fields after harvest. Last spring I scattered thirty loads on an eight-acre field, which I think has been neglected in fertilizing for about ten years. The rank growth of weeds that usually follow harvest we turn under green at times.

P. K. Symns.—Manure is removed from stock barns, feed racks and decayed straw stacks and scattered at present on corn and pasture lands.

A. L. Noyes.—I allow the manure to accumulate in the corral until I get time to haul it onto the land, unless it is liable to get too muddy, then I scrape it together with a road scraper until I can haul it.

W. R. Correll.—I have no method, I am sorry to say. I expect to have a manure scraper as soon as I can get fixed for it, and will use all the manure I can scrape up.

J. A. McKenzie.—Spread it as made, thin on the ground and frequently.

E. L. Cottrell.—Haul as soon as made.

14. What kind or quality of horses do you find profitable to keep for work?

Ans.—One, good; two, mules; one, plugs; four, Percherons.

J. A. Showalter.—It takes good horses to do good work. A well-made horse will keep easier and work better. I want my horses to weigh not less than twelve hundred—the heavier the better, up to fifteen or sixteen hundred. I have three mares and let them raise good draft colts.

Unsigned.—Would like to have good blocky horses for farm work, weighing about twelve hundred and fifty to thirteen hundred, of Percheron breed; and light horses (part road stock) weighing about eleven hundred, for use on road, going to market, etc., and for light work on the farm if necessary.

J. P. Wood.—Usually brood mares of the best quality I can raise.

C. J. Reid.—A medium weight horse of active disposition, such as are produced by standard bred sires of good sizes, bred to grade mares. This makes an excellent farm horse in my opinion. They are intelligent, active, and have good staying qualities.

E. E. Chase.—For my part I would rather have good mules. If a man has or prefers horses I should have medium weight. I have never seen heavy horses that could stand the heat and work well.

C. W. Shull.—High-grade Percheron horses. Have also used mules with great satisfaction, as they are always willing to work.

L. W. Waldraven.—We keep horses weighing about twelve to fourteen hundred; we have had good success with Norman and English grade sires of this weight.

[TO BE CONTINUED.]

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD.....Ellsworth
HON. J. W. BERRY ['83]Jewell City
HON. J. O. TULLOSS ['99].....Sedan
HON. GEO. S. MURPHEY.....Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Professor McFarland's fourth-hour class has a record of only five absences in six weeks.

The College Choral Union had its picture taken on the stage of the Auditorium last Thursday afternoon.

Last Saturday the College Dairy Department paid thirty two cents per pound for butter fat, the highest price ever paid by the College.

As we go to press there is an exciting basket-ball game in progress in the stock-judging arena, between the teams of the Faculty and the students.

The meeting of the Kansas Corn Breeders' Association will be held at the College March 2, 3, and 4. The corn-judging contest will also be held on the 4th.

The Riley County Normal Institute will be held in June. Superintendent Edgerton, of the Manhattan schools, will be the conductor and Superintendent Keller, of the Hays City schools, one of the instructors. In August both teachers will go to Hays City to conduct the normal institute of Ellis county.

The farmers of Sumner county, Kansas, are making arrangements for a farmers' excursion over the Rock Island railroad to the Agricultural College this spring. They have talked the matter over at their farmers' institutes, and are in correspondence with the weather clerks for fine weather at some suitable date.

An inquirer wants to know who our long-time contributor. Geo. C. Wheeler, is. Mr. Wheeler is assistant in feeding experiments at the Kansas State Agricultural College. He is a valuable man. His experiments are all recorded so that he is able to know what he is writing about. He is a good man to fire questions at.—*Kansas Farmer*.

Two of the senior boys, C. B. Swift and Ed. Logan, are working out an experiment to determine the number of bacteria in the air of the dairy barn at different periods during the day; and also in the milk until it reaches the separator. This experiment will be the subject for their theses and will also be published for the benefit of those interested. The work is under the direction of Assistant Foster, of the Bacteriological Department.—*Students' Herald*.

Doctor Orr photographed the decorated and set tables in the dining-room of the Domestic Science Hall just before dinner last Friday. The picture will be "cut" and published in the INDUSTRIALIST.

Mr. and Mrs. Pickering, of Olathe, are spending a week or more visiting her parents, Professor and Mrs. McFarland. With Mrs. McFarland they visited classes at the College last Tuesday, and were very much interested in what they saw.

The K. S. A. C. Choral Union will give a Grand Concert, March 16, in the Auditorium. The Choral Union will be assisted by The Tatarrax Glee Club, Asst. R. H. Brown, Miss Augspurger, and others. Professor Valley will render solos from "The Messiah."

The short-course dairy boys claim to be the most cosmopolitan class in College. Recently, each member gave a sketch of his experience on dairy lines. The combined experiences of the class touch Alabama, Colorado, Pennsylvania, Ohio, Denmark, and Alaska, besides our own State.—*Students' Herald*.

The Animal Husbandry Department has arranged for a students' excursion to Fort Riley on Monday, February 27. An extra train will leave Manhattan at 8 A. M., and return at 5:30 P. M. The fare for the round trip will be 60 cents, and it is expected that many students will be glad of the opportunity to join the excursion. The students in stock-judging, for whose special benefit these arrangements were made by Professor Erf, will be given a chance to visit the cavalry horse stables and to hear a lecture on cavalry horses.

The United States civil service commission announces an examination on March 15, 1905, to secure eligibles to fill vacancies in the positions of foreman of diamond drill boring party, foreman of wash boring party and boring party helpers under the Isthmian canal commission on the Isthmus of Panama. Also an examination on March 15, for the following-named positions in the crews of steam shovels under the Isthmian canal commission: Steam-shovel-engineer, steam-shovel crane man, steam-shovel fireman and steam-shovel head pitman. For further information, see secretary of the local board at the post-office building. The commission announces that no more clerks or typewriters are needed for the present. This part of the announcement is made because they have already several hundred applications on file for every place that is to be filled.

COMING FARMERS' INSTITUTES.

- Feb. 20, Belleville, Professor Erf and Assistant Shoesmith;
- Feb. 21-22, Rome, Professors Popenoe and Walters;
- Feb. 22-23, Oneida, Professor TenEyck;
- Feb. 28, Randolph, Professor Willard and Assistant Wheeler;
- Mar. 1-2, Bucklin, Professors TenEyck and Erf;
- Mar. 3, Sedan, Professor TenEyck;
- Mar. 7, Frankfort, Professor Walters and Assistant Shoesmith.

ALUMNI AND FORMER STUDENTS.

Daisy Day, '95, recently visited her sister, Flora (Day) Barnett, '95, in Manhattan.

P. M. Biddison, '04, is now assistant electrician with the Zeigler Coal Company, of Zeigler, Ill.

R. A. Oakley, '03, has recovered his health sufficiently to resume his work with the Department of Agriculture.

Howard Matthews, '04, is assistant head tester in the employ of the General Electric Company, Schenectady, N. Y.

Fred L. Gilbert, student in 1901, is teaching near Edgerton, and presented a thoughtful paper on "Success in Life," at the Edgerton farmers' institute last week.

Invitations are out for the marriage of Pontus Henry Ross, '02, and Esther E. Hanson, '03, which will take place Wednesday evening, March 8, 1905, in Marquette, Kan.

Bert R. Elliott, '87, of Dawson, British Yukon Territory, has been visiting the home folks for the first time in seven years. With Fred B. Elliott, '87, as guide, he took a look about the College this week.

Alfred C. Smith, '97, is very enthusiastic over the arrival of Alfred C., junior, eight and one-half pounds Troy. The young man's mother will be remembered as Mary Waugh, '99. They now reside at 7573 Sunnyside Avenue, Seattle, Wash.

The Boston *Evening Transcript* of the 11th instant contains an able article by Prof. F. A. Waugh, '91, on the subject "Dwarf Trees; Their Use, Propagation and Management." This was a paper presented before the Massachusetts Horticultural Society.

F. E. Uhl, '96, and Maggie (Correll) Uhl, '97, have been visiting the College and relatives and friends here. Mr. Uhl has purchased an interest in the Myers Sanitary Milk Company, of Kansas City, and will in the future have an important part in developing and managing the business.

Edmund R. Secrest, '02, assistant forest expert in the Department of Agriculture, will present a paper on "Tree Planting" at the Randolph farmers' institute, February 28. He has been making a visit here and at home. Birdie Secrest, '92, will present a paper, on "The Importance of Domestic Economy in Our School Curriculum," at the same institute.

Lillian (St. John) Williams, '91, will have the sympathy of many friends in the loss of her father who died on the 14th instant, at Rocky Ford, Colo. Mr. St. John was one of the earliest settlers in this locality and was held in the highest esteem. Doctor and Mrs. Williams made a short visit to the College last Saturday morning. Doctor Williams was a student here in 1895. They now reside in Kansas City, and Mrs. St. John will make her home with them.

H. M. Bainer, '00, is now instructor in field engineering in the Iowa State College. He took the degree of Master of Scientific Agriculture there last June, having studied in the agricultural department the preceding year.

While attending the Edgerton institute, Professors Calvin and Willard were most hospitably entertained by Mr. and Mrs. James Dickson. Mr. Dickson was a student in 1877, and gave many reminiscences of that early day in the history of the College. He is now a prosperous farmer with a special liking for Hereford cattle, of which he has a small herd of very choice pure-bred specimens. He was the secretary of the institute.

J. M. Harvey, '98, has a trenchant article in the last number of the *Mail and Breeze* in opposition to the position taken by certain writers against the officers of the Experiment Stations and Agricultural Colleges, and others who presume to express opinions concerning agricultural methods although they are not directly engaged in farming. Mr. Harvey, by his college course, has learned to appreciate the value of "science with practice."

Clara V. Newell, '96, and A. B. Newell, sophomore in 1895, are enjoying farm life near Glenville, Neb. Rev. and Mrs. I. D. Newell are also there now, and but for the extreme cold weather they would have their new house ready for occupancy. They report 32° below zero and snow drifts ten feet high. Merle E. Newell, student in 1898, is at the head of a grade school in Las Animas, Colo., but will spend the summer on the home farm.

H. T. Nielsen, '03, has two interesting letters in the *Students' Herald* for the 16th instant, describing the trials of a new graduate in adjusting himself to the unsympathetic world. Mr. Nielsen thinks that ten-tenths of his conceit is now worn off, but if experience is any guide he will probably learn as the years go by that, like an onion, one's conceit exists in many layers and these are peeled off from time to time throughout a long series of years.

Dalinda (Mason) Cotey, '81, Dean of the School of Domestic Science and Arts of the Agricultural College at Logan, Utah, was an important factor in a recent visit of the legislature of that state. There were about two hundred fifty, and after looking through the departments of the College until their appetites were in an active condition, they were banqueted by Mrs. Cotey's department, and, according to the *Logan Republican*, this feature was an unqualified success. It says that "The menu was all that could have been desired. There were the substantials, the dainties, the frills and furbelows, and all the rest, and it was all served by dozens of the College's universally good-looking and altogether charming young misses." Considering that the dining-room was elaborately decorated, it will be seen that the successful execution of the undertaking was a task of no mean order. It is needless to say that after the legislators had been put in good humor this way the president of the college bombarded them with a large number of hard facts concerning the needs of the institution.

J. T. Willard, '83, while attending the Edgerton farmers' institute, was very pleasantly entertained at the home of A. B. Dille. A. B. Dille, Jr., '99, is associated with his father in farming and gives special attention to Poland-China swine. They have some handsome, high-bred individuals. Cassie, '98, Grace, '97, and Walter S. Dille, second-year student in 1891, are still with the Meriden Creamery Company, of Kansas City, Mo. Alberta (Dille) Hulett, '00, with her two children, is now making her home with her father.

Nellie S. Kedzie Jones, '76, lectured before the Missouri State Dairy Association Thursday evening, February 16. The printed program says: "In connection with this part of our program it is safe to say that if it were possible for the State of Kansas to attend this meeting and hear Mrs. Jones, they would be there." Mrs. Jones made a short visit with her niece, Agnes (Fairchild) Kirshner, student in 1881, in Kansas City, previous to filling this engagement, and Henrietta (Willard) Calvin, '86, and J. T. Willard, '83, had the great pleasure of visiting with her there.

From the *Herald* we learn that:

Martha Nitcher, '01, is teaching school near Ames, Iowa.

E. C. Gardner, '04, is employed at the Union Stock Yards, Chicago.

H. M. Bainer, '00, and Clara (Nitcher) Bainer, of Ames, Iowa, are happy over a baby boy.

Hope Brady, '98, teacher in the Liberal city schools, has been appointed one of the county examiners of Seward county.

Harold B. Kempton, senior in 1900, is now at Middleton, N. Y., spraying fruit trees for San José scale. He has a thirty days' job at ten dollars per day.

C. G. Clarke, '88, of Plainville, Conn., has been called to the pastorate of the First Congregational church of Minneapolis, Minn. He accepted the call.

J. B. Griffing, '04, has resigned his position as assistant in agriculture in the Oklahoma Agricultural College, to accept a more remunerative position elsewhere.

Bob Scott, '04, has resigned his position with the Kerkhoff Dramatic Company, and is now director and stage manager of a leading theatrical company which is touring Montana.

REUNION OF THE WASHINGTON ALUMNI.

The following very interesting account is furnished by Prof. E. H. Webster, who has recently joined the Washington contingent:

The annual reunion of the Washington K. S. A. C. Alumni Association was held at Rauscher's, corner L and Connecticut avenues, on Wednesday evening, February 8.

The gatherings of the Kansas State Agricultural College dele-

gations of the past have been happy events, but all present Wednesday night expressed themselves in act and voice as having the "time of their lives" compared with former experiences of the kind.

Out of the fifty-four graduates, former students, ex-professors, and family alliances of the former known to be in Washington on that night, forty-two were present. At a business meeting held at the home of Chas. L. Marlatt, '84, a few days previous, Prof. G. H. Failyer, '77, was elected president, Miss Julia R. Pierce, '90, secretary, and Mr. A. H. Leidigh, '02, treasurer, for the coming year. The success of the evening was largely due to their good judgment in making preparations for the event.

About 9 o'clock, after introductions and greetings, Mrs. R. S. Kellogg played a beautiful selection on the piano and after responding to a hearty encore was followed by Ed. H. Webster, '96, with a few rambling remarks, touching some of the incidents of the past and emphasizing some of the needs of the present and future of our institution.

The Misses Failyer (Maude, Corinne and Lois) rendered some very nice music on the guitar and mandolin.

A very enjoyable event of the evening was conducted by Prof. A. S. Hitchcock. Each one present was given a card and pencil and asked to estimate various measurements, such as length of a stick, width of stick, weight of objects, as cotton, in ounces, a bit of lead in grains, and a piece of rock in pounds and ounces, the area of triangles, circles, surface of spheres, cones, and the length of a tangle of wire. Fifteen such estimates were made of objects furnished by Professor Hitchcock, and then answers compared with the correct measures, which were known only to Professor Hitchcock. The prizes were awarded to Lewis W. Call, '83, and R. S. Kellogg, '96—not because they were any smarter than the rest but because they guessed better.

After light refreshments were served all gathered around the piano, presided over by Mrs. Gertrude (Lyman) Hall, '97, who led the singing of songs, closing with the K. S. A. C. song and the College yell, lead by A. H. Leidigh, '02.

On adjournment, all expressed themselves as having thoroughly enjoyed the evening.

Those present were as follows: Prof. G. H. Failyer, '77; Lewis W. Call, '83; Chas. L. Marlatt, '84; Lieut. O. G. Palmer, '87; D. G. Fairchild, '88; M. A. Carleton, '87; Julia R. Pierce, '90; Bertha (Winchip) Spilman, '91; Ed. H. Webster, '96; R. S. Kellogg, '96; C. F. Doane, '96; Mrs. Margaret (Carleton) Doane, '96; Mrs. Gertrude (Lyman) Hall, '97; Wm. L. Hall, '98; E. C. Butterfield, '98; J. M. Westgate, '97; D. B. Swingle, '00; A. H. Leidigh, '02; A. B. Gahan '03; Maude Failyer, '03; Corinne Failyer, '03; V. L. Cory, '04; Geo. F. Thompson, M. S., '02; Prof. A. S. Hitchcock, Mrs. A. S. Hitchcock, Prof. D. E. Lantz, C. S. Davis, Mrs. C. S. Davis and daughter, Will R. Spilman, Mrs. Lewis W. Call, Mrs. O. G. Palmer, Nellie Thompson, Mrs. E. C. Butterfield, Lois Failyer, Mrs. M. A. Carleton, Mrs. R. S. Kellogg, John F. Strouse, Mr. Pfeiffer, J. B. Corbett, May D. White, J. E. Dorman.

Historical Society

VOL. 31

NO. 23

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U.S.A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.)...	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H.C.A. & M.A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph.B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B.S. (K. S. A. C.).....	Executive Clerk
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MARCH 4, 1905.

No. 23

PRACTICAL QUESTIONS ON FARM MANAGEMENT.*

[Continued from preceding issue.]

P. K. Symns.—A cross of Coach and Normans, a light pony, and a driving team.

A. L. Noyes.—I find the Percheron breed very good for farm work. I like to keep at least one horse of some other breed for a driver.

W. A. Coe.—Medium weight draft horses.

W. R. Correll.—I prefer good grade Percheron horses, not smaller than one thousand for work, and large German coach horse for driving and for sale.

G. F. Wagner.—Good, active horses, weighing from eleven to fourteen hundred pounds.

Edwin Taylor.—Horses with big stomachs and short legs.

A. F. Robinson.—I have common brood mares, good plugs, and for the last two years have been breeding to McGregor, one-half brother to Cesus.

A. J. Pottorf.—Have Percherons weighing about fourteen hundred. Good walkers and plenty of endurance is desirable. Horses with poor wind cannot endure the heat when the weeds are growing their best, and the sooner such horses can be replaced by sound ones the better off will be the farmer, although he has sacrificed some cash to make the change. The best is none too good for the farmer.

A. M. Reichenberger.—Keep light teams for roadsters and heavy ones for farm; average weight thirteen hundred pounds.

C. W. Taylor.—Prefer good mules but have medium-sized horses.

E. L. Cottrell.—Have Percheron horses weighing about fourteen hundred; am now crossing on the Coach horse.

Geo. Doll.—Horses that came from a cross of heavy domestic stallions and pony mares are the only ones I have had experience

*Graduation thesis, prepared under the direction of the Farm Department, Kansas State Agricultural College, by L. A. Doane.

with. * However, I would prefer horses weighing from twelve to fourteen hundred pounds.

15. Do you buy any work horses or do you raise them?

Ans.—Eighteen, raise them; ten, buy them.

E. M. Hall.—Buy them; at present prices could raise them.

16. What is your method of handling and caring for work horses?

Ans.—One, no method.

J. M. Moody.—Feed grain in stables and turn them out in the lots at nights, if the weather is not too bad.

E. M. Hall.—Stable and feed well in the winter; run in the lot when not in the harness. Turn on the grass summer nights and off in the day time. I feed corn and alfalfa hay, occasionally change feed to oats or bran, and feed prairie hay or corn-fodder when handy. Curry daily and work ten hours.

J. A. Showalter.—When working, horses should be fed and cared for, but feed is money; arrange for pastures. When off duty in winter let them find much of their own feed in vacant fields. Horses are good rustlers. Take great care in starting horses in spring time; easy collars well fitted all the time.

Unsigned.—Give horses good feed three times a day, water before feeding, try to keep them in good flesh but not hog fat. Do not let work horses have much green stuff during planting time (turn them loose in dry lot in evening during same). Let them out to exercise during winter, when they are not being worked.

J. P. Wood.—During work season, feed corn. If I have it, feed sheaf oats for roughness and at night let them on grass. When work season is over, extra horses and colts run on wheat and around straw-stacks.

C. J. Reid.—I feed liberally of corn and alfalfa hay in summer; not so much grain in winter; water regularly and often in summer; curry and brush well during work seasons, and during the hard work of cultivating, clean horses at night by spraying. Turn horses out at night during summer after grass gets good.

D. G. Page.—Young horses pastured in summer until three years old, then light work with good grain rations. Light work in winter with roughness and small proportion of grain. Young stock grained.

J. B. Harman.—Give them good quality of food and as much variety as I can. Never over-work or over-drive or leave them out in cold without blankets.

L. W. Waldraven.—We have good frame barns for horses, with capacious mangers and feed boxes. We feed for grain, oats exclusively when we have them, and especially during the hot working seasons. We feed alfalfa and oat straw as we have no prairie hay, although I prefer prairie hay. We do not allow our work horses to graze. Give them all the fresh water they want three times a day when not at work, and before and after feeding when working hard. I let my horses out to roll before feeding. I try to keep my teams well groomed, and especially do I fit collars and harnesses to the horses. I notice many farm horses suffer from ill-fitting harnesses and collars.

P. K. Symns.—Daily grooming with careful feeding with corn and oats and timothy hay and straw, and blue-grass pasture to run on at night, and when idle during pasture season. When idle during the day in winter, turn into sheltered lot to hay, salt, and play. Use carefully fitted collars and harnesses, well cleaned and in good order.

A. L. Noyes.—In spring time and all through the busy season I feed them alfalfa and a little corn. If I get short of alfalfa hay in the spring, I generally turn my horses on alfalfa meadow at night; if I get short of corn also, I find they will work moderately well on alfalfa alone. When the prairie grass is good, I turn them all out at night except one pony.

W. R. Correll.—Feed three times a day, water before feeding, amount of feed determined by the horse and amount of work done. Run them loose in pasture as much as possible when not at work. I like to feed cane fodder or a little sorghum molasses in winter time. Bathe neck and shoulders in cold water to keep from galling from hard work.

W. H. Rhodes.—Am very careful when I work them hard. I always have them fat and well cared for. Will not allow my horses to be abused.

A. F. Robinson.—Feed grain according to work—always grain, but more when they work harder. Feed plenty of hay, and do not drive work horses on the road much during farming season. Give hay at noons, water three times a day, before meals, and shelter in winter.

A. M. Reichenberger.—Give them a ration of ground corn in winter, and toward spring ground corn and oats. Good stable and good, fine hay.

C. W. Taylor.—Give kind treatment, regular feeding and regular hours.

E. L. Cottrell.—Keep them well fed and cleaned up and give good treatment. In the winter rough them through with as little grain as possible, but keep them in good flesh, so that when they are put at hard work in the spring they will not fall off in flesh. We keep them in pasture every minute they are not at work. We feed corn and alfalfa.

F. B. Buchli.—I aim to keep them at work all the time, and do not keep more than I can use. Keep them in good condition by feeding a regular variety.

17. Do you keep well-bred stock? Why?

Ans.—Eighteen, yes; three, no.

Unsigned.—Some of my stock are well-bred. Keep them because they cost no more than poor ones, and I think better results are obtained.

C. J. Reid.—Yes, it gives better returns and is more satisfactory in every way than poor stock. One has more pride in pure-bred stock, and it is more satisfactory considered from this standpoint, if not from any other.

J. B. Harman.—Yes, because it is better pay and more satisfactory when it comes to handling them.

P. K. Symns.—Yes, I find it more profitable. Have bought good cows and a fine thoroughbred Herford bull and aim to improve my herd.

18. If you make a specialty of any of the following, describe your system of managing: Dairying, cattle, seed breeding, horses, hogs, sheep, poultry, fruit farm, truck farm.

Ans.—Two said that they had no specialty, eighteen made no answer.

J. M. Moody.—We make seed corn a specialty, select one or two good varieties, plant early and cultivate thoroughly to bring best results. Hog raising is also one of my specialties. I select a good family and *line* breed but do not *in* breed. In selecting my breeding stock I select on merits and not altogether on markings, raise two litters each year.

D. G. Page.—Shorthorns sold as yearlings, or later for breeding purposes. Berkshires sold as shoats, or later for breeding.

C. W. Shull.—In connection with a business partner I am milking cows and selling separator cream and butter. Most of the

cows are a high-grade milk strain of Shorthorn, and they are bred to an excellent Galloway, which means dehorned black calves, strong in constitution and satisfactory to cattle feeders.

J. B. Harman.—In dairying I have had the best results when we weighed the feed and tested the milk, feeding approximately a balanced ration. I have had best results with Poland-China hogs, by observing good sanitary conditions and feeding as great a variety as possible and by using the Moors dipping vat and hog remedy.

W. R. Correll.—I keep seventeen cows to milk, raise calves by hand, and have been buying enough calves to put with what I raise and feed all winter. I raise all the pigs I can to run after cattle when feeding, and have eighteen brood sows at present.

19. What is your method of keeping accounts with the farm household?

Ans.—Sixteen have no methods; five made no answer.

J. M. Moody.—By keeping expense account with household, also account of produce sold, balancing accounts at end of each year.

Unsigned.—Items that enter into my household accounts are groceries, etc. In the end these are to be carried to "expense" and "cash" accounts, etc.

W. A. Coe.—Simply keep a record of the time and price of everything that is bought and sold.

E. M. Hall.—Keep a cash-book list of all expenses and personal accounts.

Geo. Doll.—I use the common method of bookkeeping. In the ledger I have opened up accounts thus: Groceries, dry-goods, household utensils, miscellaneous, luxuries, etc.

20. Was your early training such as to prepare you for keeping careful business accounts?

Ans.—Nineteen, no; seven, yes.

C. Blackler.—Have taken the business course and have seen the need of keeping accounts on the farm.

J. A. McKenzie.—Had some training and some study along that line.

21. Are your children being trained to keep accounts and records of their work and expenditures.

Ans.—Eleven, no; five, yes; others made no answer.

22. Should system in farming and the keeping of crop records

and business accounts be emphasized as practicable and profitable on the average farm?

Ans.—Two, no; twelve yes.

E. M. Hall.—That depends. Without any statistics I should say that the average farm is about 160 acres, used as a home by a family. It would have five horses, thirty cattle and some chickens. Elaborate systems of bookkeeping are not necessary, but simple records of crops, fields, breeding and expenses are both practicable and profitable. The larger the farm, the more help used and the more each crop is looked at as an investment, rather than as a necessary stock food supply, the more the necessity for keeping careful farm accounts.

J. A. Showalter.—Yes, sir. It is necessary and helps to make farm life pleasant.

J. P. Wood.—It would seem to me the most profitable thing some farmers could do.

E. E. Chase.—Yes; I think a certain amount of system in farming and farm records is desirable, but I do not believe in anything elaborate.

A. L. Noyes.—I think system in farming is a good thing. The difficulty comes in not being able to carry out any stated plan; the ever varying conditions of weather, together with the unreliable farm help, makes it exceedingly difficult with limited means to carry out any definite system in regard to farm crops. Still, I think it well to have a system in mind and carry it out if conditions will allow. In regard to crop records, I do not think they amount to much unless the farming operations are so extensive that one cannot keep the conditions and results in mind. In my own case, I should not take the time to hunt up the records of previous years if I had them, so far as making my plans for the present are concerned. Of course, if one wants the facts so as to write about them, the records would be needed. I consider that there are some accounts that it is very necessary to record, such as promissory notes, so far as to know just when the note is due and to whom it is given. Also, one's bank account must be kept, also the account with hired help. In feeding cattle, if one buys his corn he must know how much he is buying so as to know whether he is making or losing money by feeding. Of course, his check book will show sufficiently if he always gives checks in payment. Theoretically, accurate accounts of farming operations

are a good thing. Practically, I like to read and sleep evenings rather than to be recording daily accounts.

ANSWERS FROM WISCONSIN FARMERS.

1. What line of farming are you engaged in?

Ans.—Three, mixed; one, fruit; two, dairy, and two, stock.

2. Do you take an inventory of your property each year, so that you may know the value of your investment and your annual profit or loss?

Ans.—Three, no; five, yes.

3. Do you keep careful accounts of all business transactions?

Ans.—Eight, yes.

4. Do you keep daily work records?

Ans.—Seven, no; one, yes.

5. Do you keep accounts with each field or crop and with each department of your farming?

Ans.—Six, no; two, yes.

Geo. Hanchett & Son.—We keep account of what fields or crops produce each year, but have not kept account of expense with each field or crop.

W. C. Bradley.—No. With me it would not be practical.

A. B. Hicken.—No; but intend to next year.

6. Describe your system of keeping accounts.

Geo. Hanchett.—Our farm accounts consist only of such accounts as are necessary to determine our debit and credit with those with whom we do business, our expense accounts, and sales.

F. G. Frelick.—I leave a page in the record for every crop, herd of dairy cows, and account with the merchant, blacksmith, etc.

W. C. Bradley.—I simply keep day-book and ledger accounts.

Renk Bros.—Keep three books: No. 1, for expense and receipts; No. 2, for bills payable and bills receivable, and interest; No. 3, for record of breeding animals, date of birth, etc.

Geo. C. Hill.—We keep accounts with "receipts" of farm expenses, hired help, and household expenses. In addition to the above, a book is kept with records of daily cream shipments, a service record book, and a book with milk and fat records of individual cows.

F. H. Scribner.—We simply keep account of all receipts and expenditures and balance up each month, but of late years have only kept an account of sales from the farm; pay all bills by bank checks, but the day-book is the best.

7. Do you prefer married or single men as farm hands?

Ans.—Three preferred married workmen; four, single; one had never hired any help.

Geo. Hanchett.—It all depends upon the individual. Our help is mostly unmarried.

Renk Bros.—Prefer intellectual, ambitious, single men. As a rule, married men are not first class or they would start out for themselves. Have had but one married man, so have had little experience with them.

Geo. C. Hill.—Married men, who board themselves, but always have some single men.

F. H. Scribner.—Married men, as a rule; we find them steadier.

8. What is your method of handling hired help?

Geo. Hanchett.—We simply see that each man does his duty and has proper instructions for performing it, and then insist that he attend to it properly. We pay our men for all over-time and charge for all lost time. We never keep our men doing chores after 6:30 P. M. and insist on their giving us their best efforts during working hours.

W. C. Bradley.—I pay the largest wages of any one in the vicinity and try to get the men to earn their wages, but often fail.

F. H. Scribner.—We have a tenant house and hire a married man by the year. We also hire one single man and board him in the family. Our hours are out early in the morning and early in at night, making the chores a part of the day's work. Have chores done and ready for supper at six o'clock. We find that we can get more work done in the year in this way.

David Imrie.—We treat them as members of our own family.

A. B. Hicken.—I do most anything to get along with them.

Geo. C. Hill.—We rise at 4:30 A. M. the year through and the work is done at 6 P. M. Endeavor to treat a man as we would wish to be treated in his place.

9. What is your method of handling and caring for farm machinery?

Geo. Hanchett.—We overhaul every piece of machinery when we are through with it and order any repairs that seem to be needed when we leave it for the season, and oil wearing parts of plows, cultivators, etc., to prevent rust. We take better care of machinery than most farmers do, and this is not boasting, for our machinery is left exposed to weather more than it ought to be.

F. G. Frelick.—Have one big shed for all my machinery, of course. Implements are not left out when not in use. I clean all the tools before storing away.

W. C. Bradley.—I depend upon hired help largely to run my machinery, but keep close watch that it is well oiled, nuts kept tight, and cutting parts sharp. Keep painted and under cover except when in use.

Renk Bros.—We are a little slack in this respect, perhaps. We try to keep machinery housed when not in use, though it is not always repaired as soon as we are through using it, to be in readiness for next year.

F. H. Scribner.—All machinery is carefully housed and cleaned the day we are through with it. I am sure that more machines are rusted out, rather than worn out.

David Imrie.—We house it as soon as through with it.

A. B. Hicken.—I am exceedingly careful with all my machinery. My plan is to bring the machine I am using home with me and draw under the shed until I go back to the field again.

Geo. C. Hill.—Nearly every machine is covered or put in the shed every night.

10. What per cent do you allow each year for the depreciation in value of farm machinery?

Ans.—The answers were partly in the nature of estimates and the annual average depreciation allowed was ten to fifteen per cent on first cost.

11. Do you practice a definite system of crop rotation? What is your plan?

Ans.—All do.

Geo. Hanchett.—Yes; always clover before small fruit. In our grain raising our rotation is clover, corn, oats, then clover.

Geo. C. Hill.—Our usual rotation is corn on land manured during winter and plowed in the spring. Wheat, clover, and oats.

F. G. Frelick.—Yes, my plan is two years clover, with a little timothy; third year, wheat or peas; fourth year, oats, barley, or rye. This last cereal is best with us; it affords a better chance for a catch of clover. Of course, seed down the fourth year.

W. C. Bradley.—Try to have a system of rotation, but often get knocked out on account of not getting a stand of clover. We try to have grain, clover, and corn. Our pastures are permanent, rough land.

Renk Bros.—As near as we can. Pasture two years, corn one or two years, oats, and then seed down again.

F. H. Scribner.—Yes; our rotation is a four-year one—one year in corn, one year in grain, and seed to timothy and clover; two years in grass, first year cut for hay, second year use for pasture.

David Imrie.—Yes; hay and pasture, next corn, then oats, and seed to clover—a three-year rotation.

A. B. Hicken.—I mean to if the weather will permit; first, meadow; second, corn and potatoes; third, grain and seed down.

12. Do you feed the crops on the farm, or sell and remove them from the farm?

Ans.—All feed everything except wheat, and a good many buy feed besides.

13. What is your method of saving and handling manure?

Geo. Hanchett.—During winter we haul to field as soon as made, and during summer store in shed.

F. G. Frelick.—I never allow my manure to remain in the yard more than six months. I haul manure every spring and summer, and some during the winter months on rye field as top dressing.

W. C. Bradley.—Manure is taken to the field and spread from wagon or sled as fast as made.

George C. Hill.—During the winter the manure is drawn to the field each day, and summer manure is drawn on pastures at frequent intervals.

Renk Bros.—Haul direct to fields as soon as it accumulates, as much as possible, and spread from wagon. (Think the manure spreader is a fine thing.)

F. H. Scribner.—All manure is drawn directly to the field from stable and spread upon the pasture-land that is to be planted to corn the following season.

David Imrie.—It is hauled directly from the barns in the winter and applied to clover fields. Yards are cleaned up spring and fall.

14. What kind or quality of horses do you find profitable to keep for farm work?

Geo. C. Hill.—Twelve to fourteen hundred pound chunks.

Geo. Hanchett.—Good grade Percherons.

[TO BE CONTINUED.]

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. MCDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD.....Ellsworth
HON. J. W. BERRY ['83]Jewell City
HON. J. O. TULLOSS ['99].....Sedan
HON. GEO. S. MURPHEY.....Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Winter term closes March 24, and spring term opens March 28.

Ex-Regent Ed. Secrest, of Randolph, was a welcome visitor at the College last Friday.

Among our visitors on "Corn Day" we noticed Professor Cowgill, of the *Kansas Farmer*.

The annual inter-class basket-ball contest will be held in the Woman's Gymnasium, Monday, March 6, at 3 P. M.

The Veterinary Department has recently issued Press Bulletin Number 135, on the subject of ringbone and spavin.

The Marshall County Club celebrated Washington's birthday by a social. They always have a good time when they meet.

Professor Popenoe reports the loss of a pocket lens valued at seven dollars. The finder is requested to return it to him or to leave it at the College post-office.

Prof. I. J. Edgerton, of Burrwyn, Ill., accompanied by Assistant Kinzer, of the Animal Husbandry Department, looked through our laboratories, shops and stables on Saturday.

The students' corn-judging contest is being held to-day, Saturday, March 4, and is on as we go to press. The result will be published in the next issue of the INDUSTRIALIST.

The Farm Department had a unique exhibit of plows, planters, harrows and cultivators on the lawn in front of Agricultural Hall last Friday and Saturday, for the benefit of the farmers who attended the Corn Breeders' Association.

Prof. W. L. Hofer, formerly of the Music Department of the College, was taken to the Parkview hospital last week. He had a serious attack of erysipelas in the face, but is slowly improving.

The College Band furnished some excellent music for the opening session of the Kansas Corn Breeders' Association, Thursday evening. Among the selections played was a fine overture, also a piccolo solo, with band accompaniment, by Mr. A. H. Hoffman.

Professor McCormick has ordered a projecting reflectoscope for his lecture room. The apparatus permits the projection not only from lantern slides but also from drawings and book illustrations and from actual objects. The light is furnished by an improved electric lamp.

The Mechanical Engineering Department is fitting up a blueprint room to be used in connection with the new drawing room. It will have a track extending over the court of the shops and a heavy adjustable frame running on wheels. The glass is a polished Pittsburgh plate and the backing a corrugated rubber blanket.

The department of mechanical engineering has received word from the P. B. Miles Concrete Machine Company that they will donate one of their concrete block machines to the College. This machine will build artificial stone or concrete blocks in all the standard sizes, shapes and finishes and will be used for work in the department.

The excursion to Fort Riley by the classes in animal husbandry last Monday was a complete success. Three hundred thirty-four tickets were sold and all who went report a good and profitable time. The officers of the Fort assisted Professor Erf in the examination of the cavalry horses and gave the students all the information they desired. The special train carrying the excursion party returned to Manhattan at about seven o'clock.

At a recent athletic conference of the representatives of the Kansas colleges held in Topeka, the rules governing athletics in each of the institutions in the conference were strengthened to conform so far as possible with the rules of the colleges in the "Big Nine." A student in the Kansas colleges, to represent his college, must be in actual attendance one term before participating in any athletic contest. This varies from ten weeks at some of the colleges to twenty weeks at the State University.

The Farm Department will soon move into new offices on the east side of the main entrance of Agricultural Hall. The former cheese room has been partitioned off into three office rooms—one for the professor, one for the assistants, and a third for the typewriter. The partitions are of paneled woodwork, with flor-entine glass along the upper parts, and look very attractive. The work is being done by contract by Henry Bennett, of Topeka.

Prof. Philipp Rehfeld, of Berlin, Germany, the manager of the agricultural exhibits of that country at the World's Exposition at St. Louis, visited the College Thursday, Friday and Saturday of last week, in company with Professors Walters and Erf, with whom he had become acquainted in St. Louis last spring. He also visited a number of representative farmers and business men to study agricultural conditions. Professor Rehfeld went from here to Kansas City to see the stockyards and elevators. From there he will go to Milwaukee to study the great breweries, and to Chicago to observe the methods of the large provision houses. His observations will be published by the German government, for the benefit of the farmers of that country. The professor was greatly pleased and interested in everything he saw, and declared the Kansas State Agricultural College a marvelous institution of effective and practical education.—*Daily Republic*.

The Rock Island has granted an open rate of one-and-one third fare for the round trip to persons within fifty miles of Manhattan who wish to attend the Musical Festival at the Auditorium on March 16. Tickets will be sold March 15 and 16, good returning on the 17th.

The Kansas Corn Breeders' Association met at the College, March 2 to 4. Over an hundred farmers and specialists were present and several hundred students attended one or more of the sessions. Supt. P. H. Ross, in charge of the Experiment Station of Alaska, Dr. Geo. M. Tucker, manager of the Tucker plant breeding farm at Blodgett, Mo., Arnold Martin, of Duboise, Neb., and others were present and gave addresses. Professors Ten Eyck, Roberts and Willard and Assistant Shoemsmith of this College also read papers, and the meetings were full of enthusiasm from beginning to end. A corn exhibit of several hundred specimens was a center of constant interest. The meetings were held in the old College chapel.

On March 16 will be given a grand concert, at the College Auditorium, by the Choral Union, assisted by the Tatarrax Glee Club, the College orchestra, and Professor Valley and other soloists. Several of the selections will be taken from the "Messiah." In the afternoon the five cadet companies will give a special drill, followed by a free band concert in the Auditorium. It is intended to make this concert an annual event, and every effort is being made to draw one of the largest crowds ever gathered at the Auditorium. Advertising agents will be sent into the neighboring towns to arrange for excursions. Certain sections in the Auditorium will be reserved for the visitors. Ticket boards will be placed, one at Willard's drug store and the other at College. Price of tickets, 35 and 50 cents. The following program will be rendered:

Florodora.....	Stuart
COLLEGE ORCHESTRA.	
Bridal Chorus (from Rose Maiden).....	Cowen
CHORAL UNION.	
Carnival Scenes, Op 26.....	Schumann
CECILIA AUGSPURGER.	
Nightingale and Rose.....	Lehnert
CHORAL UNION.	
Caprice de Concert.....	Musin
R. H. BROWN.	
Gipsy John.....	Clay
OLOF VALLEY.	
Annie Laurie.....	Buck
TATARRAX GLEE CLUB.	
Hark, Hark My Soul.....	Shelley
CHORAL UNION.	
(a) Nocturne.....	Brassin
(b) Etude.....	Chopin
CECILIA AUGSPURGER.	
Selections from "The Messiah".....	Händel
(a) He was Despised.....	EDITH HUNTRESS
(b) Why do the Nations.....	OLAF VALLEY
(c) I know that my Redeemer Liveth }	CHORAL UNION
(d) Hallelujah Chorus..... }	

Upon assembling in their rooms over the Spot Cash Saturday evening the members of the T. O. S. fraternity were surprised to find a beautiful chafing dish on one of their tables. The boys also discovered a number of cards, and upon each card the name of a lady friend. The donors were: Misses Cecilia Augspurger, Freda Marty, Gertrude Haulenbeck, Frances Fish, Crete Spencer, Edith Huntress, Clare Cave, Nellie Hughes, Rhoda McCartney, Caroline Morton, Jewel Spohr, Louise Fleming, Irene Taylor, Elizabeth Sweet, Florence Sweet, Nellie Baird, and Elva Akin.

ALUMNI AND FORMER STUDENTS.

Deane C. Arnold, third year in 1894, who has been mining in the Klondike near Dawson City for the last five years, visited home this winter. He started back to Dawson on the 1st instant.

Grace Allingham, '04, on account of failing health has resigned her position as instructor in domestic science in the Girls' Industrial School at Beloit, and Florence Ritchie, '04, has been appointed to fill the vacancy.

Mrs. B. A. Patten, mother of John Patten, '95, Ethel (Patten) Ames, '95, and E. B. Patten, '98, died at Sycamore, Ill., on the 24th of February, after a prolonged illness. Many friends will unite with us in expressions of sympathy.

Invitations are out for the wedding of Edith Perkins, '00, and Fred Myers, senior in 1901. The wedding will take place at the residence of the bride's parents, Mr. and Mrs. Henry A. Perkins, at South Pasadena, Cal., Thursday evening, March 9, at 8 o'clock.

In the death of Capt. J. T. Smith, February 24, Manhattan has lost a model citizen, the Methodist church a sincere and active member, and G. W. Smith, '93, C. C. Smith, '94, and B. W. Smith an affectionate and much-loved father. To all of the bereaved the sympathy of many friends is extended.

By the courtesy of Professor Dickens, '93, we have seen a beautiful little book of "Leaves," poems of Matie (Toothaker) Kimball, second year in 1893, printed by C. A. Kimball, '93, publisher of the *Courtland Register*. A foreword explains that the booklet was originally intended to be sent to the friends of Mr. and Mrs. Kimball as the first Christmas greeting of their daughter born September 6. The printing was delayed, however, and December 31 the little one "went away." The greeting has been changed to a token of loving sadness, and is dedicated: "To Gloria Lillian Kimball, beautiful flower from the garden of love, these fugitive, vagrant verses are tenderly inscribed by her mother." The eight short poems touch as many phases of life in a sympathetic and melodious manner and will be much appreciated by those who receive them. The printing is in bronze, with a leafy border in green, the paper dainty, and the whole production very attractive.

Historical Society

VOL. 31

NO. 24

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York).....	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg).....	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami).....	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D. V. M. (Cornell University).....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.).....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.).....	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B. S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Science
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B. S. (K. S. A. C.).....	Executive Clerk
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MARCH 11, 1905.

No. 24

PRACTICAL QUESTIONS ON FARM MANAGEMENT.*

[Continued from preceding issue.]

F. G. Frelick.—I prefer the draft type of a horse of the smaller breeds. We have lots of red clay here, so we must have heavy horses. Drafters are most profitable here, but foundation stock is scarce.

W. C. Bailey.—We keep six horses—four of them sixteen hundred pound mares that raise us colts nearly every year, one team twelve hundred pound horses for road work and light farm work.

Renk Bros.—For farm work and not for sale. I prefer the American trotter, with as much size as possible. They are handy at turning, stand the heat, and do not tire as easy in loose footing (as spring work). Should weigh from twelve hundred to fourteen hundred pounds if possible.

F. H. Scribner. We find that horses weighing fourteen hundred pounds, well put up, are the most profitable as they are suitable for road work as well as for farm work.

David Imrie. High-grade Percherons weighing from fourteen hundred to seventeen hundred pounds.

A. B. Hicken. I use ordinary farm stock valued from \$100 to \$150.

15. Do you buy your work horses or do you raise them?

Ans.—Five, raise them; two, buy; one does both.

Geo. Hanchett.—Have bought most of them; will raise in the future.

F. G. Frelick.—We have raised ours, but will have to abandon it because we do not have the mares of weight, substance, and quality. We must buy more good draft mares.

Renk Bros.—Raise most of them and buy some on speculation, mostly good draft colts.

16. What is your method of handling and caring for your work horses?

*Graduation thesis, prepared under the direction of the Farm Department, Kansas State Agricultural College, by L. A. Doane.

F. G. Frelick.—The care our horses get is this as regards feeding: Water first thing in the morning, feed hay while they are being curried, after this they are given their grain. The heaviest feed is given at night. I keep them shod in front the year around, and reshoe every four to six weeks.

Renk Bros.—Give all the water they want when unhitched from the field if not too warm (which is rarely the case). Let stand twenty to thirty minutes and eat hay, then feed grain. Nights, we turn out on good clover pasture and get them up in the morning. Usually they are on hand for breakfast without going out after them. This keeps the horses clean and healthy, both body and feet. Give the horse the heaviest grain feed at night; also hay. No hay during the day, except a few minutes at noon, and you will never have a heavy horse. Grind feed for horses when working very hard, give a little oil-meal and corn night and morning, with oats for variety. (One or two tablespoonfuls of oil-meal and four to six ears of corn to a feed.)

F. H. Scribner.—Horses, like men, must be used in reasonable hours. I can accomplish more in eight hours with a team that has some snap than my neighbors who drag along twelve to fourteen hours a day. The horses are fed the first thing in the morning, usually four quarts of oats and what hay they will clean up, and the same noon and night.

David Imrie.—They are fed clover hay night and morning and oats three times a day, with a little corn in winter. When not at work they are turned out to pasture, and groomed night and morning.

A. B. Hicken.—Water first thing in the morning, then feed hay and grain, also follow same plan noon and evening. I do not water in middle of forenoon. In winter, when I do not work horses, I feed a good deal of fodder corn.

17. Do you keep well-bred stock? Why?

Ans.—One, no; seven, yes.

Geo. C. Hill.—Yes; greater profit and greater pleasure.

F. G. Frelick.—We do not keep well-bred stock, but I have learned the advantage of better breeding at Madison, Wis., where I took the short course in agriculture.

W. C. Bradley (breeder of pure-bred hogs).—Yes, because I like them better than scrubs or grades. I am not sure that there is any more money in them for me than in grades, for they take so

much work in keeping up records, keeping them apart, tagging and marking them, crating and delivering them one at a time, advertising, etc. But I like it and keep at it.

18. If you make a specialty of any of the following, describe your system of managing: Dairying, cattle, seed breeding, horses, hogs, sheep, poultry, fruit farm, truck farm.

Geo. Hanchett.—We make a speciality of small fruits, devoting fifty acres to their culture. Our stock farm is carried on principally as a means of supplying fertilizers to small fruit farms, or we prefer to buy bran and feed milch cows to buying fertilizers. We aim to have soil well supplied with humus before planting, and find clover most satisfactory for this. We raise our own plants for setting, from plants selected for their vigor and fruitfulness. I give thorough cultivation and winter covering. Employ only reliable help. The harvest is a critical time and requires well-regulated systematic work. One overseer has general charge of the packing force and has as many assistants as the size of the crew requires. Each picker has a number, and each row picked has this number placed at the end so that the overseer can examine it as opportunity offers, and know who is responsible for the thoroughness of the work. Picker accounts are kept by means of tally-cards. It is also necessary to keep in touch with all markets within reach by wire at this time, as systematic distribution is very necessary to avoid overloading the market.

F. G. Frelick.—Dairying is our specialty. We practice partial soiling in summer and begin feeding green corn from September until the crop is ready for harvesting as fodder. Milk is worked into cheese. We sow oats and peas for soiling.

Renk Bros.—Sheep. In the fall of the year we try to have our sheep in very good condition. Usually have some rape for them to feed upon. We think that rape is the cheapest feed for sheep there is. If in good condition, for two reasons, they winter better and keep healthier, and if gaining quite rapidly just before breeding time we expect a larger per cent of twins. We are very particular in selecting sires to secure the best, as the sire is half of the entire flock. Have paid as high as \$50, \$80, and \$100 for our rams. We usually divide our breeding sheep into two or three flocks at breeding time so as to breed about seventy-five head to a ram. Usually turn the best rams in only an hour every day. This makes it easier on the ram than if allowed to run with the

flock, and the ewes get in lamb just as fast. We feed our rams a little oats twice a day.

During the winter we like to have our sheep take lots of exercise, so have a large yard for them to run in. Arrange to have feed at each end of the lot so they will run back and forth as much as possible. Keep good water and salt before them at all times. We like to feed large quantities of roughage and hardly any corn. Feed some oats and bran and silage as lambing time approaches. Good clover hay makes a balanced ration for feeding ewes in forepart of winter. Later on, feed a little grain with clover. Most of our lambs drop in March, so by the time spring begins the lambing season is over. Early lambs make larger lambs to show and sell. We like to keep our sheep in small flocks and change pasture often. Usually fatten our lambs on rape and ship them to Chicago—that is, what are not kept for breeding purposes.

David Imrie.—Care of horses. Brood mares are worked lightly up to foaling time, and some while colts are sucking, but not much. Cattle: We milk some cows and calves suck some. We are not dairying. Feed steers winters, in yard and barn. Hogs: We raise for pork, also breeding stock. As to our method of care and feeding, you will find it described very fully in our next Farmers' Institute Bulletin.

F. H. Scribner.—Dairying is our specialty; keep the pure-bred Jerseys; get the best sires I can find and keep calves from best cows, and the way we find out best cows is to weigh milk every day in year and apply the Babcock test. Feed liberally of silage every day in year and discard the unprofitable cows.

Geo. C. Hill.—We have a contract for cream in Milwaukee to a wholesale dealer, who takes what we have, be it little or much. Cows fresh all seasons of the year, except June to September 1. Silage, clover hay and bran form the bulk of their feed in winter, and bran, silage and pasture in summer. We aim to have a piece of red clover and timothy for pasture in addition to the permanent bluegrass and white-clover pasture.

19. What is your method of keeping accounts with farm household?

W. C. Bradley.—Give my wife all the money she wants and charge to expense account.

Geo. C. Hill.—Keep a record of all money expended for household, but keep no record of what we use from farm and garden, except milk.

Renk Bros.—Book everything that is paid out or taken in.

David Imrie.—Keep account of only our grocery and butcher's bills.

A. B. Hicken.—We use the double-entry system.

20. Was your early training such as to prepare you for keeping careful business accounts?

Ans.—Four, no; two, yes.

A. B. Hicken.—Not at home, but I took a course in bookkeeping while at college.

21. Are your children being trained to keep records and accounts of their work and expenditures?

Ans.—One, no.

W. C. Bradley.—Not yet, but will be later.

Renk Bros.—Have no children.

22. Should system in farming and the keeping of crop records and business accounts be emphasized as practical and profitable on the average farm?

Ans.—Four, yes.

F. G. Frelick.—Yes; it may be profitable if it does not involve too much work, but keeping accounts in a simple order will prove instructive in later years.

Geo. Hanchett.—Most emphatically, yes.

Renk Bros.—Yes, by all means.

Geo. C. Hill.—My opinion is that it would not pay to keep a full set of books, or accounts with fields, except occasionally.

ANSWERS FROM DAKOTA FARMERS.

1. What line of farming are you engaged in?

Ans.—One, stock raising; two, general.

Preston Farm Co.—We are engaged in farming over four thousand acres, our principle crop is wheat, but we raise corn, oats, millet, and potatoes, and we keep a lot of pigs, besides two or three hundred head of steers.

Lewis Pond.—Diversified farming, bearing in mind that pure seed and careful plowing of the land are essentials that cannot be slighted if a fair crop is desired; that scrub seed and scrub stock makes scrub farming.

2. Do you take an inventory of your property each year so that you may know the value of your investment and your annual profit or loss?

Ans.—Four, yes.

3. Do you keep careful accounts of all business transactions?

Ans.—Three, yes.

4. Do you keep daily work records?

Ans.—One, no; two, yes.

5. Do you keep an account with each field or crop and with each department of your farming business?

Ans.—One, Yes.

Preston Farming Co.—We keep accounts with departments of our farming business and with crops, but not with feed.

6. Describe your system of keeping farm accounts.

Massingham & Cosgrove.—Double-entry bookkeeping.

Gould Farm.—I keep a ten-column journal-ledger and time-book.

7. Do you prefer married or single men as farm hands?

Ans.—One preferred single men.

Lewis Pond.—Farm hands are our worst drawback. They are hard to get and harder to keep.

Gould Farm.—Single men. Married men should have farms of their own.

8. What is your method of handling hired help?

Massingham & Cosgrove.—Strict rules for rising and regular hours for work.

Lewis Pond. — Following the teachings of the "Golden Rule."

The Gould Farm.—Hire them for fair wages, treat them as men, bind them to no contracts, and expect a reasonable amount of work in return.

9. What is your method of handling and caring for farm machinery?

Preston Farming Co.—All farm machinery is housed in a good machinery hall, except at the time it is used and a few days previous to that time while we are putting it in order.

10. What per cent do you allow each year for the depreciation in value of farm machinery?

Ans.—Two, ten per cent; one, fifteen per cent.

11. Do you practice a definite system of crop rotation? What is your plan?

Preston Farming Co.—We cannot practice a definite system of crop rotation, but have three crops of wheat, then usually seed to barley or oats, then to timothy, and run that for two crops of hay and one of pasture; then we break it up again and start in with

wheat, oats, or barley, then put the land in to corn, potatoes, or millet, and the following year return to wheat again.

12. Do you feed the crops on the farm, or sell and remove them from the farm?

Ans.—Two, feed; two, both sell and feed.

13. What is your method of saving and handling manure?

Massingham & Cosgrove.—Take everything from correls and stables direct to fields and spread the same from wagons.

Lewis Pond.—“The manure pile is the farmer’s gold-mine,” and should be judiciously cared for. Our soil is very rich, but the farm cannot be drawn upon forever without some return being made in the shape of home-made fertilizers, mainly for the sake of humus as a conserver of moisture. The live stock are well bedded, the horses and young stock have their stalls cleaned twice a week, when the bedding has absorbed all the liquids. The manure is hauled directly onto the field and evenly distributed, but not too thickly, as it might leave the ground too loose, and the field is seeded to millet for hay. Straw for bedding being plenty, the cattle go loose in a part of the barn, thirty by eighty-four feet, which is cleaned once a month and the manure hauled directly to the field, thus no loss of phosphates or ammonia takes place, and the hauling twice of heavy manure is avoided.

14. What kind or quality of horses do you find profitable to keep for farm work?

Massingham & Cosgrove.—Breed large ones—Clydes or Percherons.

Preston Farming Co.—We use French Percheron horses, or rather a good grade of that breed. One-third of our work stock is mules.

15. Do you buy your work horses or do you raise them?

Ans.—Three, raise them; one, buy them.

Lewis Pond.—Raise them and you get kind, gentle horses.

16. What is your method of handling and caring for your work horses?

Preston Farming Co.—Our work horses occupy one large barn or stable, which will accommodate seventy-two head. During summer months they are worked nearly every day; during December, January, February and March they run loose in the barn lot, as we have but little to do and one or two teams will do the work in winter.

17. Do you keep well-bred stock? Why?

Ans.—Three, yes.

Preston Farming Co.—We keep as much well-bred stock as possible, as they are the best and most profitable.

18. If you make a specialty of any of the following, describe your system of managing: Dairying, cattle, seed breeding, horses, hogs, sheep, poultry, nursery, fruit farm, truck farm.

Massingham & Cosgrove.—Only registered Herfords.

Lewis Pond.—Live stock: Stock should not be unduly exposed; must be kept growing and well fed. A stingy feeder cheats himself.

Gould Farm.—Dairying: We have the Red Polled cattle, keep a separator, sell our cream, raise our calves on skim-milk, excepting bull calves which run with the cows that raise two to four calves each season, *i.e.*, we buy or put calves from other cows with them; first two suck four months, next two until about two months of fresh time. We do no seed breeding; leave that for the Agricultural College. Hogs: We raise the large-boned Berkshires, raise two litters annually, have green annual crops for them, such as Canada peas, rape, barley, oats, corn, mangles, etc., keep in separate lots, and feed some grain until fattening time or at the age of about seven months, when we force them with all the corn, oats, barley, and mangles they will eat. Feed all ground feed, dry, with all the fresh water they want before feeding. We just started in the sheep line with fifty Shropshires. Know very little about them. We raise the "Farmer's Hen," the Barred Plymouth Rock; breed these straight; change cock every year. Raise some berries, etc., but none to sell. Also have a fine garden.

19. What is your method of keeping accounts with the farm household?

Massingham & Cosgrove.—Keep debit and credit account of every article used.

Gould Farm.—Keep a household account in ledger and charge all domestic help and provisions to that account.

20. Was your early training such as to prepare you for keeping careful business accounts?

Ans.—One, no; one, yes.

21. Are your children being trained to keep records and accounts of their work and expenditures?

Gould Farm.—Certainly will be when they are old enough.

22. Should system in farming and the keeping of crop records and business accounts be emphasized as practicable and profitable on the average farm?

Ans.—Three, yes.

Preston Farming Co.—We think that system in farming is as essential as in any other business, and advise all farmers to keep a careful record and a set of books, and we believe that a man will find it much more profitable to have system and plan his work than anything else he can do.

[TO BE CONTINUED.]

FRAUDULENT COTTONSEED-MEAL.

Several samples of cottonseed-meal recently analyzed in our chemical laboratory indicate a serious condition in respect to the cottonseed-meal furnished the farmers of this State. This by-product is purchased as a concentrated feed and is valued because of its high content of protein and of fat. A good judgment may be formed in respect to the value of a given meal by determining the amounts of these principles present. Average cottonseed-meal contains about 42.3 per cent of protein and 13.1 per cent of fat. A meal analyzed some weeks since contained 40.66 per cent of protein and 8.13 per cent of fat. This is evidently inferior, but not in a high degree. Within the last week, however, two samples have been analyzed which contained, respectively, 23.7 per cent of protein and 5.2 per cent of fat, and 18.49 per cent of protein and 4.47 per cent of fat. These two samples were sold in Butler county and Franklin county, and it is evident from their composition that they are fraudulent in a high degree; the better one of the two contains only about half as much protein and fat as it should, while the poorer one is considerably worse. These samples were apparently adulterated with ground cottonseed hulls. The great importance of this fraud upon our feeders must be apparent. Many other states have laws regulating the sale of concentrated feeding stuffs, as a result of which farmers are for the most part free from such imposition; Kansas, having no such law, is a free field for such exploitation. The need of a thorough chemical control of the sale of fertilizers, concentrated feeding stuffs and foods in this State becomes constantly more and more evident.

J. T. WILLARD.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College. Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD Ellsworth
HON. J. W. BERRY ['83] Jewell City
HON. J. O. TULLOSS ['99]..... Sedan
HON. A. M. STORY..... Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Professor Kammeyer visited the State University last Monday.

Regent Berry visited College and his daughter Ethel, last Saturday.

The bluegrass on the campus is turning green, the buds are swelling, and the tulips are raising their heads. Beautiful spring is here.

Assistant Wheeler, of the Animal Husbandry Department, reports that the College sheep herd is multiplying at the rate of twins and triplets for the past few weeks.

The Union Pacific has also granted the one and one-third fare to persons wishing to attend the musical festival on the 16th. Arrangements are being made to run a train up the Blue after the concert.

The result of the inter-class basket-ball game Monday was, freshmen 9 and sophomores 13, juniors 25 and seniors 18. The final game will be played next Monday, March 13, between the sophomores and the juniors.

The following officers were elected at the Y. M. C. A. meeting Sunday afternoon: President, E. C. Farrar; first vice-president, W. B. Thurston; second vice-president, B. H. Wilbur; secretary, E. L. Shattuck; treasurer, J. R. Garver.

The Engineer's Association begins bi-weekly meetings next Monday evening, when Earl Wheeler will give an illustrated talk on the "Electrical Equipment of the New York Central Railroad," and Clyde Lewis will discuss air-brakes.

Some hungry specimen of *genus homo* succeeded in stealing two small cheeses in Dairy Hall last week. As they were not cured, the dairy foreman is anxious to inform the abstractor that uncured cheese is liable to interfere with the proper workings of one's digestive organs, even to the extent of a good sized doctor bill.

The Choral Union, assisted by the Glee Club and Orchestra, will give their First Annual Musical in the College Auditorium on Thursday, March 16. There will be a battalion parade and free band concert in the afternoon. Reduced rates will be given on all railroads. The admission will be 35 and 50 cents. A program of the musical was published in last week's INDUSTRIALIST. Everybody invited.

A rate of one and one-third fare for the round trip has been granted by the Rock Island to those persons within fifty miles of Manhattan, including Topeka, Alta Vista, and Morganville, who wish to attend the Musical Festival, March 16, with minimum of twenty-five cents.

Thomas C. Magoffin, of the Department of Commerce and Labor, Washington, D. C., visited the College printing-office last week and asked for a report. The report given him shows the total business done during 1904 to have been \$6446.86, divided as follows: Salaries, \$1400.00; pay-roll, \$2648.77; material, \$2398.09. This makes an average monthly business of \$620.57+.

The noted sculptor, Lorado Taft, gave an illustrated lecture on sculpturing in the Auditorium last Thursday night. The lecture was one of the regular College lecture course. It was well attended and appreciated. The artist is certainly a lightning modeler who knows all about the wrinkles of facial expression. He kept his audience laughing and shouting from start to finish.

The Animal Husbandry Department has arranged for a trip to Topeka on March 13 to visit the Wolff Packing House and the Continental Creamery. Over one hundred students will probably join the excursion. The party will stay over night and return on Tuesday. Arrangements have been made by Professor Erf for special rates on the Union Pacific, the railroad fair for the round trip being only \$1.55, *i. e.*, half the regular rate.

The corn-judging contest of the agricultural course students last Saturday and Monday resulted as follows: The sweepstakes were—A. D. Colliver, 82.3 per cent; F. A. Kiene, 81.2; G. E. Yerkes, 78.2. The winners of the \$5 prizes were: Senior class, A. D. Colliver; junior class, F. A. Kiene; sophomore class, J. S. Montgomery; freshmen class, Eugene Gammon; second-year short course, E. R. Trout; first-year short course, C. J. Crighton; special students, F. L. Williams. The winners of Fielding Trophy were—E. R. Trout, W. W. Goddard, H. L. Bennett, A. D. Perry, Coy Lupfer.

The State legislature last week passed the following general appropriation bills for the Kansas State Agricultural College:

	1906.	1907.
Horticultural building, greenhouses and equipment...	\$25,000	\$25,000
Addition to boiler room.....	3,000	.....
Three 125-horse power boilers and stacks.....	10,000	.....
Addition to engine room.....	.....	3,000
Granary.....	4,000	.....
Current expenses.....	90,000	100,000

The amount appropriated is about \$20,000 above that received two years ago, and will be sufficient, together with the contributions from the central government, to meet the wants of the institution. Thanks are due to the many friends of the College in the legislature, especially to Senator Dolley of this senatorial district and to Representative Peter of Riley county, for their effective assistance.

The Architectural Club has perfected its organization and has adopted a constitution. The club will meet Saturday, March 23, in the City Library, and regular meetings will be held after that date. A peculiar feature of their sessions will consist in the comparison and discussion of original sketches, of which every member is required to submit at least one at every regular meeting.

The College Band will give a concert in connection with the Music Festival next Thursday afternoon, March 16. The concert will be in the Auditorium, and will begin promptly after the battalion parade. *No admission except between numbers.* The following is the program:

Overture.—“Il Guarany”.....	Gomez
Piccolo Solo.—“Sweetheart” Polka.....	Brockenshire
MR. A. H. HOFFMAN.	
Selection.—“Blue Bell”.....	Chattaway
Idylle.—“Simple Aveu”.....	Thome
March.—“Louisiana Purchase”.....	Losey
“Star Spangled Banner”	

Jeff. Samson, the largest steer in the world as far as the world's record is concerned, is no more among the living. The College sold him last Monday to Mr. Ed. Knight, of Manhattan, who shipped him, with other cattle, to Kansas City to some packing-house. Samson, as the students called him, was about five years old and weighed, when he was in his prime at St. Louis last summer, nearly four thousand pounds. He visited many other fairs throughout the West, after he had seen the great world's exposition, and was admired by thousands of people in his star tours, but all good steers must become steak and soup, and Samson was no exception to the rule.

The new residence of President Nichols, near the main entrance to the City Park, is nearing completion. The carpenters are nearly through with their work and the building is in the hands of the plumbers, painters, and decorators. The fresco work of the rooms is being done by Mr. Ohst, of Alma. Another month will complete the interior, though the leveling of the yard, the building of the cement walks and curbings and the planting of bluegrass, bushes and evergreens will require the whole of the spring season. The building is roomy and well arranged, modern in every respect, and will be one of the very finest and most substantial dwellings in central Kansas.

The new Regents appointed last week by Governor Hoch, in place of Messrs. C. E. Friend, and Geo. S. Murphey whose term expired with the legislative session this winter, are well-known public men in Kansas and are highly satisfactory to the friends and patrons of the Agricultural College. Mr. A. M. Story, of Manhattan, is the county attorney of Riley county, and Mr. Geo. P. Griffith, of Hays City, is the editor of the *Hays City Republican*, one of the leading papers of western Kansas. Mr. J. S. McDowell, of Smith Center, who was appointed to succeed himself, has been a Regent of this College since spring, 1899, and this is his third reappointment. He has been president of the Board for four years.

ALUMNI AND FORMER STUDENTS.

Rev. R. U. Waldraven, '89, is now located at Atchison, Kan., instead of at Julian, Neb.

J. G. Haney, '99, is now in charge of the work in the department of farm crops in the Iowa State College at Ames, since the resignation of Prof. L. S. Klinck.

W. W. Hutto expects to move into a new modern five-room cottage, which he is having built on the site of his residence burned last fall, in about five weeks.—*Nationalist*.

Dr. Geo. W. Smith ['93] shipped his household goods to Kansas City Monday. Mrs. Smith, accompanied by Mrs. J. T. Smith, will join the doctor in a couple of weeks.—*Mercury*.

The genial presence of H. C. Rushmore, '79, was felt among us again this week. He attended the morning exercises and noted the forcible contrast between the scene and that of thirty years ago.

Rev. D. E. Bundy, '89, is now located at Julian, Neb., where he is pastor of the Julian circuit. His work is with an excellent class of people and he enjoys it very much. He is always interested in the work and success of the College.

A. D. Whipple, '98, is now salesman for the Chicago Linoleum Company, and has been on the road for several weeks working up their business in Nebraska and this State. He called at the College on the 8th and was warmly received by a number of his classmates.

Mrs. J. F. O'Daniel and daughter, Miss Anna, returned from Topeka Saturday. Miss Anna gave her graduating recital Friday evening. She will complete her course in Miss Anna Bundy's school of music in June. She will make regular trips to Topeka and continue her study.—*Nationalist*.

Ross Long has resigned his position as traveling salesman for the Knakal wholesale house and has opened up a law office in the rooms occupied by F. B. Elliott, the real estate man on Poyntz Avenue. Mr. Long is well known here and will no doubt do good work as an attorney in Riley and adjoining counties.—*Nationalist*.

Albert Dickens, '93, while on a recent farmers' institute trip to Lincoln enjoyed the hospitality of Mr. O. N. Greene, whose interest in K. S. A. C. has been active since G. O. Greene, '00, entered in 1896. R. W. Greene, junior in 1903-'04, is carrying on the home farm and was one of the prime movers in the institute, being secretary. He has had a prosperous season; a big wheat crop and a car of stock finished with a combination of corn-and-cob meal and Kafir-corn made his bank account grow. Helen Kernohan, '04, and E. E. Kernohan, senior in 1904, of Beverly, Kan., were guests at the Greene home during the institute. Miss Kernohan read a paper on "Domestic Science" and Mr. Kernohan discussed

"Grape Growing," and also had a hard-luck story of wheat drowned out by high water from the Saline river, but had good crops of Kafir-corn and alfalfa, and reported successful work in the feed lot, ground Kafir-corn mixed with corn-chop giving good gains.

Geo. O. Learned, short course student in 1902, writes from Stafford, Kan., inquiring concerning varieties of trees and the whereabouts of Holstein cattle breeders. He reports that he has bought a good quarter-section of Stafford county land, and that he has a good home, a good wife, and a bouncing baby boy.

In the February number of the *Botanical Gazette* H. N. Whitford, '90, begins the discussion of the Forests of Flathead Valley, Montana, the conditions that determine the appearance and nature of the forests of that region, and, inferentially, the nature of the conditions of forest development in other regions. This is a part of the results of his work as a collaborator in the United States Bureau of Forestry.

A. L. Messick, student in 1903, is teaching near Winona, in the northwestern part of Logan county. He feels that he cannot return to College, but values highly the training that he received here. He wishes the College with all of its instructors and students never-failing success. He states that Watson Handley, Orlando Hutto, Effie Hutto, and Kate Alfrey, former students from that county, are prospering and still to be found in the short-grass country.

H. T. Nielsen, '03, visited the College this week on his return trip from the Ross-Hanson wedding. He reported that the ceremony took place at the appointed time and that the bride and groom seemed to be in the happy state so frequently noticed on such occasions. Mr. and Mrs. Ross sail from Seattle for Kenai, Alaska, the tenth of next month. Mr. Nielsen returns to Ames, Ia., to complete his study for the Master's degree, after which he will resume his work with the Bureau of Plant Industry.

From the *Santa Fe New Mexican* we get the following sad news concerning E. C. Abbott, '93: Friends of District Attorney and Mrs. E. C. Abbott will be deeply pained to hear of the death of their little two and a half year old son, E. C. Abbott, Jr., at half an hour past midnight February 25. Only yesterday the members of the Abbott household were happy in the belief that their dear little man had successfully passed the crisis of his illness and would soon again be the laughing sunshine of the home in which he was idolized. His death, therefore, was the more poignant in the grief it brought for that bright hour of hope. Not until late yesterday afternoon did the dread symptoms of an unfavorable reaction manifest themselves. Every effort known to the medical world was made in behalf of the little sufferer, but it was to no avail, his little life's slender cord was loosed and the tiny soul having slipped earth's leash left the night of the world for the day of eternity.

Historical Society

VOL. 31

NO. 25

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U.S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D.V.S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I.T.U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.).....	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H.C.A. & M.A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph.B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecillia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B.S. (K. S. A. C.)	Executive Clerk
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MARCH 18, 1905.

No. 25

PRACTICAL QUESTIONS ON FARM MANAGEMENT.*

[Concluded.]

The following are the names and addresses of the farmers answering the questions:

P. K. Symns.....	Atchison, Kan.
L. W. Waldraven.....	Randolph, Kan.
John B. Harmon.....	Gill, Kan.
C. W. Shull.....	Winona, Kan.
A. L. Noyes.....	Wabaunsee, Kan.
E. E. Chase.....	Merriam, Kan.
D. G. Page.....	Manhattan, Kan.
C. J. Reid.....	St. Clere, Kan.
John Thralls.....	Lawrence, Kan.
J. H. Edwards & Son.....	Castleton, Kan.
A. H. Buckman.....	Topeka, Kan.
E. L. Cottrell.....	Wabaunsee, Kan.
C. H. Butler.....	Frankfort, Kan.
Edwin Taylor.....	Edwardsville, Kan.
A. F. Robinson.....	Morrill, Kan.
A. J. Pottorf.....	Riley, Kan.
Thomas M. Potter.....	Peabody, Kan.
A. M. Reichenberger.....	Andale, Kan.
W. H. Rhodes.....	Tampa, Kan.
A. A. Williams.....	Lyon, Kan.
W. A. Coe.....	Ford, Kan.
G. F. Wagner.....	Enterprise, Kan.
C. W. Taylor.....	Pearl, Kan.
W. O. Peterson.....	Randolph, Kan.
Leonard Wingfield.....	Junction City, Kan.
E. E. Ford.....	Moran, Kan.
John Sessler.....	Uniontown, Kan.
O. B. Haven.....	Belleville, Kan.
E. M. Hall.....	Milford, Kan.
J. M. Moody.....	Eudora, Kan.
J. A. Showalter.....	Halstead, Kan.
J. P. Wood.....	Freeport, Kan.
F. G. Frelick.....	Kewaunee, Wis.
W. C. Bradley.....	Hudson, Wis.
John P. Buzelet.....	Eden, Wis.
H. J. Renk.....	Sun Prairie, Wis.
Alfred B. Hicken.....	Waukesha, Wis.
Geo. Hanchett & Son.....	Sparta, Wis.
David Irmie.....	Roberta, Wis.
F. H. Scribner.....	Rosendale, Wis.
Geo. C. Hill & Son.....	Rosendale, Wis.
Lewis Pond.....	Churchs Ferry, N. Dak.
Massingham & Cosgrove.....	Harmon, N. Dak.
Gould Farm.....	Buxton, N. Dak.
Preston Farming Co..	Blanchard, N. Dak.
J. L. McDowell.....	McCammon, Idaho.

*Graduation thesis, prepared under the direction of the Farm Department, Kansas State Agricultural College, by L. A. Doane.

In the following discussion I have attempted to summarize the answers given above and have also offered some general suggestions bearing on the subjects.

From the answers to question No. 1, it seems that most farmers are coming to realize that it is better to plan to utilize the feed produced on their farms in the raising of stock. This, as is readily seen, has an advantage in two ways over the old method of selling grain and hay. First, it gives the farmer the easy way of hauling (or driving) his produce to market, *i.e.*, in a concentrated form. Second, it keeps the fertilizing constituents of the feeds on the farm that grows the feed, and this alone is worthy of careful consideration.

A majority of those who answered question No. 2 take a yearly inventory of their stock and business equipment. Farming is a business, and to carry it on most successfully requires that it be carried on like any other successful business, on business principles.

By the answers to question No. 3 it is shown that most of the persons replying keep an account of the transactions that occur in their farming business, a very few going so far as to keep accounts with each individual field, or enterprise, and with the daily work required upon the farm. The keeping of accounts with fields and labor is just a little more than the best agriculturists seem to want to try; though it cannot be denied that such records would be of interest and value to any farmer who has system in his farming plans. Such accounts, carefully kept, show where many a dollar goes out or comes in that ordinarily could not be accounted for, and if kept in proper form such records need take but little of the farmer's time, whereas they may add much to his worldly possessions, knowledge, and satisfaction in life.

The sixth question and answers need no comment, except to suggest to those who have not or do not keep account of their business transactions because of a deficient knowledge or training in this line, that there are now on the market several forms of farm record books that make it a very easy matter for anyone to keep a careful and correct account with his farming business.

The answer to question No. 7 seems to be largely a matter of choice or circumstances. In some cases the married man is to be preferred, while in others the single man fills the place to the best advantage. As a rule, it will be found that the married man will

be the steadier; but a single man of good habits will often make the better hand of the two.

In considering question No. 8, again circumstances will have to be taken into consideration, but where the hired man can be taken into the home and treated as one of the family, I believe that results will be more satisfactory than the method of herding the laborers in separate quarters. The first method gives the hired man no ground for the complaint that the members of the family think themselves "better" than their hired help, something that is to be avoided if possible in a free country like this of ours. Then, too, it gives a man a better chance to become acquainted with his employer, thereby giving him some cause and stimulous to make his employer's interests his interests.

In handling farm machinery there is no better method than that of repairing each implement as soon as it is through with its season's work, or at least buying the repairs at once where they are of such a nature that one can fit them himself; then some wet or rainy day the implement can be put in readiness for its next work, and the trouble that always comes by putting things off until the last minute can be avoided. Where a machine is left until the last minute it generally means that it is not ready for use until about three days after it should be running.

In answer to question No. 10, various estimates were made, and this is probably because there is no way in which the exact percentage of depreciation in the value of machinery through use can be calculated, and as C. W. Taylor says, "It depends upon the party that runs it." In hardly any other thing will there be so much difference in men, not altogether because one man is more careless than another, but some people have a lack of understanding machinery and know how to care for it, while others are largely lacking in this respect. With ordinary care I think ten per cent per annum is sufficient to allow for the wear and tear on most farm machinery, if judgment is used in the purchase of the machines. Where a man buys the very cheapest article he can get, as many do, thinking that thereby they are saving money, then the loss by wear and breakage might well be put as high as twenty-five or thirty per cent. It should be borne in mind that the lowest-priced articles are not always the cheapest. A good maximum to have here is that "price denotes the quality."

A great deal might be written on the subject of crop rotation.

In looking over the various answers to question No. 11 it will be observed that the rotation of crops is as yet receiving very little attention in Kansas and Dakota, while in Wisconsin the farmers practice rotations of such a character that the soil is maintained and even increased in fertility. It will not be many years until the agriculturists of Kansas will be forced to follow the examples of the farmers of the more eastern states in this line, and the sooner they commence the practice the less intense will it have to be followed in years to come. *Now* is none too soon to commence reserving the strength of the fertile soils of our State. One way, and the least expensive way, of saving and adding fertility to our soils is proper rotation of crops. Simply changing from one grain to another until we have run through the list of grains grown, and then repeating, is not enough. The land should be given a rest from these crops. This is best accomplished by seeding to some tame grass or perennial legume (clover or alfalfa). Legume crops not only rest the soil, but through the bacteria that work upon the roots of these plants, nitrogen, which is the chief flesh-forming element in feeds, is taken from the air and made into a form available for plant production; also the grass, alfalfa or clover roots grow deep into the soil, loosening the subsoil and separating the particles from one another, thus forming new soil and finally, when the sod is broken up, the roots decay and form humus, giving new life and vigor to the land.

Closely related to this method of maintaining the fertility of our land is the preservation and utilization of barn-yard manures. It is encouraging to note that the answers to question No. 13 indicate that the farmers in Kansas are now saving and using this farm product nearly if not quite as thoroughly as the farmers of Wisconsin. May this practice continue to increase. The barn-yard manures are the cheapest and best fertilizers known. More on this subject I need not say, for in so brief a summary one could not hope to do justice to the subject. Let every farmer study this question and use the farm manures, and it will pay him in dollars and cents.

On the horse question nearly all farmers seem to agree that for all-round farm work the horse of medium weight (twelve hundred to fourteen hundred pounds) is the best. Probably such horses are favored in preference to the heavy draft horses because of the greater activity of the smaller horses, enabling them to be driven

at a faster gait than a walk, if necessity demands a little speed, whereas with the heavy draft animals nothing will knock them to pieces faster than traveling on the road. With the present high prices of horses there is no doubt but that it will pay any farmer to raise his own horses. Then there are other phases of the subject to be looked at. When a man raises his own colts he knows the breeding of the animal and can raise just such a horse as he wishes, and the handling of the colt from colthood up gives him an understanding of the temperament of the animal that cannot be known or learned in a day. If one has the breeding and raising of his own stock he can grow a well-bred animal almost as cheaply as he can raise a scrub, and there is great satisfaction in having a well-bred animal that shows its breeding in its looks and actions. This is not only true of horses but of other stock as well, and when it comes to selling well-bred stock the animals will always go at a higher price than the ordinary scrubs, or animals of mixed breeding, which is also a source of pleasure as well as profit to the seller.

Of all the questions asked, No. 22 received the best answers and comments. Personally, I believe that system and method should be carried into the conducting of every business. System can and should be used in farming. Of course, everything about the farm can not be run as smoothly as clock-work; but the work, rotation of crops and business of the farm should be carefully planned, and with some allowances for necessary changes, these plans can and should be carried out.

Have a time for doing everything, with a little spare time for the additional work that comes up. Do all work at the proper time and keep everything in its place. If system in the work is carried out, a system of records and accounts will have to be kept as an aid to the work. These accounts and records should not require an elaborate system of bookkeeping, but should be so simple and yet so complete that a person may look them over and tell what work was done at a certain time, how long it took to accomplish a certain piece of work, with the cost of material and labor required.

As a summing-up of the relative standing of the three states on methods of farm management, it appears from the data that Wisconsin, in methods of all kinds pertaining to farm work, is ahead. This is probably due to the greater necessity which exists in that

1	Adv. Composition..... A 62	Algebra III..... A 63	Botany II..... F 53	Woodwork II..... S 26	Composition..... A 32
2	Woodwork I..... S 26	Classics..... A 62	Algebra III..... G 54	Botany II..... F 53	
3	Botany II..... F 53	Woodwork II, 4..... S 26	Classics..... A 36	Algebra III..... A 63	Botany I..... H 26
4	Geometry I..... C 13	Sewing II, 4..... F 53	Woodwork I, 4..... S 26	Composition..... A 36	Algebra III..... A 26
5-6	Geomet. Drawing, 2..... A 80 Object Drawing, 2..... A 76	Botany II..... F 53	Sewing I, 4..... A 80 Obj. Drawing, 2..... A 76	Freehand Drawing, 2..... A 76	Freehand Drawing, 2..... A 76

FRESHMAN.

1	Algebra II..... A 26	Phys. Geography II... C 63	Ancient History..... A 46	Adv. Grammar..... A 33	Algebra I..... C 13
2	Composition..... A 32	Algebra II..... A 26	Phys. Geography II... C 63	Ancient History..... A 46	Bookkeeping..... A 71
3	Medieval History..... A 46	Readings..... A 32	Algebra II..... A 71	Phys. Geography I..... D 31	
4	Botany I..... H 26	Medieval History..... A 46	Readings..... A 32	Algebra I..... A 71	Adv. Grammar..... A 33
5-6					

PREPARATORY.

1				Arithmetic A..... W 33	U. S. History B..... G 53
2				U. S. History A..... G 53	Grammar B..... W 33
3				Grammar A..... W 33	Geography..... G 53
4				El. Physiology..... F 60	Arithmetic B..... W 33
5-6					

1					
2					
3					
4					
5-6					

(1) Every other day beginning March 28.
(2) Every other day beginning March 29.

state of being more careful and saving, since the soil is older and competition is closer than in the West. Hence the necessity of practicing the best farming methods. The reports from North Dakota came mainly from large ranches. In managing such farms, the business must be divided into a number of heads, making the practice of business methods and the keeping of strict accounts even more necessary than on the smaller farm.

L. A. DOANE.

PRACTICAL VS. FANCY POINTS IN CORN JUDGING.

WITHIN the last few years great interest has been awakened in the possibilities of improvement of corn, and it has been demonstrated that by intelligent selection strains may be produced in which protein, starch or fat is made the dominant characteristic. The agricultural colleges are giving marked attention to instruction in corn judging, the agricultural papers exploit the subject, and the hard-headed practical farmers are beginning to think that there may be something of value in it.

All of this interest is right and if wisely directed must yield valuable returns, but from much that appears it would seem that some of the most vital factors in making up one's judgment on a variety of corn are almost, and in some cases completely, neglected. To rationally judge corn we must keep constantly before us the object for which corn is produced. Though a handsome plant, corn is not grown for ornament; though an ear of corn may be a thing of beauty, beauty is not the aim in its production. By far the greater portion of the corn crop is produced and used directly for feeding. The remainder, not required for seed, is used in certain industries in which one or another of its constituents may possess a special value. For the great majority of farmers, therefore, that corn is best which will produce the most nutriment per acre. The production of nutriment per acre, considering now the ears only, will depend upon (1) the weight of shelled corn per acre, and (2) upon its chemical composition. Here, then, are the vital points in corn production—yield and composition—yet neither of these appears on the ordinary score-card, though of course some of the points considered in scoring have an indirect bearing on them.

The score-cards emphasize points that have much to do with the beauty of the individual ear but which have little or no bearing

upon its practical value. Varieties are judged with reference to an arbitrary standard selected as a type, notwithstanding the well-known fact that the type of any variety of corn is altered by a change of climatic relations. It is insisted upon that the ends of the cob must be well covered with grain, that white corn have white cobs and yellow corn red cobs, and that the rows must be straight. All these are merely fancy points, conformity to which does not insure, nor even tend toward, a maximum production of nutriment per acre. It might even be argued that possession of a cob which is not always filled to the utmost limit is a variety characteristic to be sought rather than to be discarded, since it indicates a habit of growth which in favorable seasons might be taken advantage of to extend the length of the rows of grain.

We have seen how quality has been made subservient to fads in respect to color of pure-bred cattle; we see in the judging of poultry how the practical points have been almost suppressed by the fancy, in scoring. Should we not take pains to avoid any such degeneration in corn judging? We have an example worthy of imitation in the practices of some of the breeders of dairy cattle in which a statement of the milk and butter production of the individual and its ancestors and relatives is a part of the record accompanying its pedigree.

Corn judging will lack very much of being on a practical basis until a variety is judged by its crop-producing power first. The chemical composition of the crop produced is the next consideration, after which accessory and fancy points may receive some attention. A variety producing thirty bushels of handsome ears per acre should not receive a moment's favorable consideration compared with one producing thirty-five bushels of ears however deficient in beauty the latter may be. It will of course require more work, more keeping of records, but what the practical farmer wants is yield per acre, and the agricultural college or experiment station that makes this the first consideration in corn judging will be reaching up to its possibilities.

Differences in composition cause equal weights of corn to have different values. Corn being deficient in protein and our most abundant grain, a variety showing yield equal to another, but having a higher percentage of protein, would possess superior value. So, too, fats, though containing the same elements as carbohydrates, contain them in different proportion and, weight for

weight, possess about two and one-fourth times as great feeding value. Fifty-six pounds of corn containing seven per cent of fat would have about as great feeding value as fifty-eight pounds of corn containing only four per-cent of fat, the amount of protein being supposed to remain the same in the two cases.

"Handsome is as handsome does." Let us judge varieties of corn on a record of past performance, rather than of promises for the future based merely on good looks. J. T. WILLARD.

Of the fifty-six or more land-grant colleges in the United States, organized under the so-called land-grant act of 1862, eighteen were from the [start connected with state universities and became departments that were named "school of agriculture," "school of engineering," "polytechnic school," or "industrial college." Most states have founded separate institutions to meet the requirements of the organic law which demands imperatively that the interest of the funds resulting from the land grant shall be used "for the benefit of Agriculture and the Mechanic Arts." The Southern States have generally organized separate schools for whites and colored students. Twelve states have named their institutions like our own, *i. e.*, simply "Agricultural College." Six states have adopted the name "Agricultural and Mechanical College," eight states have named the land-grant institution "College of Agriculture and the Mechanic Arts." One state (Delaware) calls its institution simply "State College." One state names it "Scientific School;" one calls it "Agricultural College and School of Science," and one gave it the name "Polytechnic Institute." The colleges for colored students are generally named like those for the whites. In Europe there are many kinds of technical colleges that teach agriculture. The great majority of the higher technical institutions of university grade are called "Polytechnica." Provincial schools are named "technica," even if they teach several branches, such as agriculture, forestry, technology, architecture, railroading, engineering, etc. Schools of a local character are named "School of Agriculture," "Ecole d'Agriculture," "Ackerbauschule," etc. J. D. WALTERS.

W. F. Schreiber is remodeling his cottage, according to plans prepared by H. A. Spuhler, a student of the Architectural Department, K. S. A. C.—*Daily Republic*.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. MCDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD Ellsworth
HON. J. W. BERRY ['83] Jewell City
HON. J. O. TULLOSS ['99]..... Sedan
HON. A. M. STORY..... Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Ex-Regent Hunter, of Blue Rapids, was in town Friday on account of the Thompson funeral.

Miss Ada Rice gives an address this afternoon before the Riley County Educational Association, at Riley.

The Library Department has just received a box of thirty valuable new books, mostly of a scientific character, of McClurg & Company, in Chicago.

The Anderson book-store has offered a loving-cup to the player making the best batting record this season. The prize winner must have played in half the games. The Athletic Association appreciates this encouragement.—*Students' Herald*.

Arrangements have been completed for growing tests of varieties of grains and corn, with a number of county farms in co-operation with the Experiment Station. The required seeds have been forwarded to these substations by the Farm Department.

The Farm Department is sending large quantities of seed corn and grain to farmers in all parts of the State. The corn is mostly Reid's Yellow Dent, Kansas Sunflower, and McAuley's White Dent, and is sold at \$2.50, \$1.50 and \$1 for first, second and third grades, respectively.

The second annual stock-judging contest will be held Monday, March 20, in the arena at the barn. Eight prizes have been donated by swine breeders of the State, and a sweep-stakes medal has been offered by the Zenner Disinfecting Company, of Detroit, Mich., to be awarded the best judge.

Two coach loads of people came down on the Blue Valley to attend the Choral Union concert. The visitors were mostly from the stations along the Blue Valley between here and Marysville. Considering the wet weather it was a good crowd from the Blue river towns.—*Daily Republic*.

A class of students from the State Agricultural College has been in Topeka for the past two days judging cattle and hogs at the Wolff packing plant. They have followed the animals and the products through the various packing processes from before the slaughter till the product was ready for the market. Accompanying them were Professors Erf, Kinzer, and Wheeler.—*Topeka Daily Journal*.

The dairy classes have completed their work of butter and cheese making and are trying their skill at manufacturing ice-cream. Parties wishing to buy College ice-cream should call on Assistant C. W. Melick, in Dairy Hall. Only five cents a dish—full measure and running over.

George Dearborn and a cousin of his left Saturday in a covered spring wagon for Sheridan and Thomas Counties, where they expect to avail themselves of some of that good, rich land at a low price. George is a younger brother of Charlie Dearborn, who is an assistant in the Mechanical Department at the College.—*Daily Republic*.

The Gifford sale of shorthorns, at Manhattan, Tuesday, was largely attended by out-of-town buyers and a goodly number of farmers and students. The bidding was quite spirited and the sale generally satisfactory to the owners, and showed good work on the part of the salesmen, Colonels Brady, Sparks, and Little. The bulls averaged \$106, cows \$86.

Chas. S. Davis, formerly superintendent of printing here, is now in the office of the Geological Survey, 1330 F street, N. W., Washington, D. C., where he holds the position of editorial clerk under the editor-in-chief of the publications of the Geological Survey. The *Washington Trades Unionist* confidently anticipates that he will do himself and his friends full credit.

The Farm Department has about completed the equipment of the soil physics laboratory. The whole arrangement of laboratory tables, office partitions, closets, shelves, water and gas fixtures, etc., will cost nearly \$2000. Everything about the new laboratory looks modern and substantial and the department now has one of the finest and best-arranged office and working quarters in the West. The woodwork was done by contractor Henry Bennett, of Topeka.

The Kansas State Dairy Association will hold its eighteenth annual meeting at Salina on April 5 to 7, 1905. Because of convenience in reaching the city, the first session will be an evening one. There will be no evening session on Friday. By this arrangement visitors will be able to reach Salina on the afternoon trains of Wednesday in time for the evening session and will be able to leave on the afternoon trains on Friday, without missing any of the sessions. As in former years, there will probably be a number of prizes offered for butter and cheese.

Last Sunday the trunk of Tom Capsey, a short-course student from Jackson country, who was leaving for home, was searched at the depot by the local officers and in it were found two lap robes, one belonging to Mrs. H. S. Roberts and one to Fred B. Elliott; also some hats, brushes, etc., stolen from various parties. Capsey plead guilty before Justice Bowen and was held until his father arrived, who paid the fine and costs, amounting to \$22, and took the young man home. Tom promised the judge that he would sin no more, and was glad to get away so easy.

Those persons chemically inclined will be very much interested by a visit to the Experiment Station laboratory in the northeast corner of the basement floor in Physical Science Hall. Several original pieces of apparatus have been designed and constructed by those connected with the Experiment Station work. Among these are two burettes, operated by an air pump. These are for acid and alkali used in nitrogen work. A small water-heater, which may be regulated as to temperature from 30° to 99° centigrade, and a revolving filter stand containing twenty glasses, are other interesting pieces. Asst. R. H. Shaw has designed and constructed a revolving titrating table, which is operated by a small motor. This piece of apparatus makes it possible to do very accurate work in titration.—*Students' Herald*.

A meeting of the Y. M. C. A. was held at the Congregational church Sunday afternoon for the purpose of creating an interest in and securing subscriptions for the proposed Y. M. C. A. building. The amount previously subscribed was \$17,137. At the meeting yesterday \$997 was subscribed. This makes in all \$10,014 subscribed by students. The business men of Manhattan have subscribed \$3,010. An appeal was made yesterday to the students that they interest their friends at home in the K. S. A. C. Y. M. C. A. building and thus make an effort to secure subscriptions. The amount wanted before beginning the building is \$25,000. At the meeting Sunday Professors Eyer and TenEyck and President Nichols made very interesting addresses. The aim of these addresses was to imbue the mind of each student with the important work done by the Y. M. C. A. and the need of aiding the association in their efforts to provide a suitable building.—*Nationalist*.

The First Annual Concert of the Choral Union of the Kansas State Agricultural College was given in the Auditorium on Thursday night, March 16, and was a grand success, notwithstanding bad weather and almost impassable roads. The program was rendered as published in the INDUSTRIALIST two weeks ago. The choruses were sung by one hundred twenty-four students under the direction of Prof. Olof Valley, producing a powerful and beautifully blended musical effect. The Tatarrax Glee Club, of twenty-seven members, rendered a fine glee. The College Orchestra, of thirty-five pieces, under the leadership of Asst. R. H. Brown, played an overture, and there were several solos and instrumental numbers by Professor Valley, Miss Edith Huntress, Adele Blachly, and Assistants Cecilia Augspurger and R. H. Brown. The Auditorium was well filled and the music well received, all agreeing that the concert was the finest ever given at the Agricultural College. Visitors had come from many places outside of Manhattan. Much credit is due to the students for their excellent behavior pending the thunder-storm that raged about the building during the progress of the concert. The electric lights flared up and at one time went out altogether, but the perfect discipline of the singers and musicians prevented a break of any kind.

ALUMNI AND FORMER STUDENTS.

A. C. Havens, '96, has moved from Dwight to Manhattan, and is managing the farm of Mrs. Bayles, north of the city. This arrangement enables Ruth (Bayles) Havens, student in 1885, to be with her mother.

As a result of the professional efforts of Prof. A. Dickens, '93, at the Lincoln institute, the city has bestirred itself and is taking steps to beautify the park, and the rural population roundabout is manifesting a revival in respect to setting shrubs.

Chas. M. Weeks, student last year, now employed by the Cooper-Hewett Electrical Company, of New York City, spent the week before President Roosevelt's inauguration superintending the placing of the large mercury lamps in the post-office building for the inauguration illumination.

C. E. Friend, '88, after two years service as a Regent, has been succeeded by Mr. Geo. P. Griffith, of Hays. Mr. Friend has made an excellent Regent and the opportunity to renew old friendships that many Manhattan people have enjoyed by his periodic visits has been much appreciated. We hope that he may still be in our midst from time to time, even if not in an official capacity.

Shaw's Chautauqua Bureau, of Bloomington, Ill., advertises Margaret M. Mather as lecturer and demonstrator in domestic science. But for an excellent half-tone portrait accompanying the announcement we might not at first suspect that this referred to Myrtle Mather, '02. Miss Mather lectured a number of times under the auspices of this bureau last summer, and has the greater portion of next summer already filled by engagements. She is still instructor in domestic science at the Soldiers' Orphans' Home at Bloomington, Ill., but is reported to be planning for a still larger field next year.

Geo. K. Thompson, '93, died at his residence in Marysville at seven A. M. March 15, from pneumonia following grippe. He was buried at Manhattan Friday, the funeral services being conducted by the Masonic lodge of Blue Rapids, of which Mr. Thompson was a member. About thirty of the Masonic brethren accompanied the body from Blue Rapids and many others at Manhattan joined in paying this last respect to the dead. The stricken wife, Eusebia (Mudge) Thompson, '93, had the comfort and assistance of a number of relatives, among them her father, Melvin R. Mudge, Dora (Thompson) Winter, '95, and Doctor Winter, of Kansas City, and all of the family in Manhattan. Mr. Thompson had nearly completed his term of service as superintendent of public instruction for Marshall county and had embarked in the hardware business. His untimely death will bring sadness to very many beside those in the family circle. He was of a singularly genial and sanguine temperament and had many strong friends among his acquaintances, who will feel the deepest sympathy for Mrs. Thompson in her bereavement. To refresh the memories of earlier graduates we may state that Mrs. Thompson is a granddaughter of Benjamin F. Mudge, for many years a professor in this institution.

Historical Society

VOL. 31

NO. 26

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE


♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894. 

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.),	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.),	Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.),	Assistant Professor of English
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.)...	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B.S. (K. S. A. C.).....	Executive Clerk
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MARCH 25, 1905.

No. 26

ACCLIMATIZATION WITH REFERENCE TO CORN BREEDING.

Address Before the Kansas Corn Breeders' Association, Manhattan, Kansas, March 3, 1905.

THERE is no more obscure problem in connection with the breeding of plants than that of acclimatization. Let us analyze the factors concerned. Manifestly, the most stable elements in a climate, the most uniformly constant, are the supply of heat and light from the sun. The amount and distribution of the water-supply, including precipitation, drainage and evaporation, is a less constant factor. The amount, character and distribution of the chemical compounds in the soil, while most various in different localities, appears to exercise less influence on vegetation than was formerly supposed. So long as nine essential elements are present in the form of soluble compounds, and alkali salts are not in excess, the texture of the soil and its drainage and aeration seem more important matters for plant life than the greater or less amount of different food salts.

Above the surface of the soil, the nature and extent of the prevailing winds is a most vital determining climatic factor for plants, as is very well known. Altitude is a factor, in so far as it affects the water-supply either by excessive drainage or excessive evaporation, and also by the greater relative light exposure or insolation to which high altitudes as well as high latitudes subject growing plants.

It is surprising how loosely the term acclimatization has been taken, and how little in an experimental way has been done in the study of acclimatization of plants. With animals, more perhaps is known. But recollect that the animals—at least the higher mammals which we domesticate—live usually for periods of from several to very many years, during which time the vital organs, the nervous and circulatory systems, and the other physiological agencies at work in the body have time and opportunity to readjust themselves to new and changed conditions. The very fact of the existence of the power of locomotion in the higher ani-

mals, involving their ranging from place to place for food, reaching new climates and presenting themselves and their progeny as subjects for the operation of natural selection, has apparently resulted in leaving the animal organism more plastic and adaptable than that of the plant.

Plants lack the power of locomotion. Migration is not by individuals but by generations, for the most part through the transport of seeds or spores. The simplicity of the plant's life, the fixity of its position, its initial inertia, so to speak, its utter final dependence on what a fixed and undisturbed root system shall be able to do for it—all this speaks in explanation of the relatively less adaptable character of the plant's organism as compared with that of the animal.

Furthermore, it so happens that our chief economic agricultural plants, the great main crop plants, on the improvement and adaptability of which depends in so large measure the increase in our agricultural wealth, are annual plants. From seed to seed it is one season with nearly all of them. What a short time for the operation of changed climatic conditions upon a single individual! Hence, with these plants, acclimatization is practically a question of survival of progeny.

Let me first bring before you two, and so far as I know at present, the only absolutely scientific and well-planned experiments of any note in the acclimatization of plants. Climate alone is the variable quantity, all other factors being excluded.

A French investigator, Gaston Bonnier, reported in 1895 his extensive experiments for ten years on the adaptation of lowland plants to an alpine climate. Plants from thirty-five distinct orders or families, representing twenty genera and one hundred twenty perennial species were taken, the roots or root-stocks mechanically divided, half of each plant was sent to a station in the Alps or Pyrenees Mountains, while the other half was grown in its normal home in the lowlands. It was sought to obtain thereby, results that would represent the influence of climatic factors alone. The changes ensuing in the portions grown in the alpine regions were assigned to the more intense light, the drier air, and the lower temperature. It was found that the underground parts were better developed relatively than the aerial parts. The aerial stems were shorter, more hairy, more prostrate upon the soil, and with shorter and fewer joints or internodes. The epi-

dermis was thicker, the leaves smaller, more hairy, thicker in proportion to their surface area, and of a deeper green. The flowers were relatively much larger and more highly colored. A large number of minor internal structural changes were also found to have taken place.

The other case of acclimatization deals with annual plants. I refer to cases of acclimatization of cereals in Norway, cited by Schübeler, based partly upon his own experiments. He found that the transfer of Indian corn and other cereals to higher altitudes and more northerly provinces in Norway resulted in the shortening of the period of vegetation and in a diminished yield. In five years the maturing period of the variety of corn grown was shortened from four to three months. The same held true of wheat and rye. Now, in this case it is evident that what happened was a process of natural selection, whereby the earliest-ripening individuals furnished seed for the next year's sowing, while the later-ripening plants, being caught by the frost, left no offspring.

A real question is, however, left unanswered here. Would any one of the earlier-ripening plants have ripened later than say three months if it had remained at the lower level or in the more southern provinces, or was there a corresponding process of natural selection going on down there to eliminate the earlier-ripening individuals and preserve the later ones?

We may perhaps suppose natural selection to work in this way, in the case of, say, Indian corn of a ninety-day growing period, carried to a region where a one hundred twenty-day period obtains. In the first year, there being nothing in the climatic factors to bring the vegetative growth to a close, as the end of the ninety days approaches, probably most of the plants would continue growing. All of the plants with later tassels and later ears would be preserved, and their seed would be sowed next year in mixture with the seed from the earlier-maturing plants. Now, later corn has a greater stature than early corn, and planted with it would tend to shade the lower stalks and render them feebler; moreover, in the next year and in each succeeding one, every external condition would favor the prolongation of the growing period of all the stalks, so that each year the suppression of the short, early ripening stalks would go on apace.

There is need, however, of experiments similar to those instituted by Schübeler, but in which exact statistical studies on a

quantitative basis would be carried on to reveal the precise nature of the sequence of events that goes on when an annual is taken from a warmer to a colder climate, and the reverse. It is perhaps easier to see the working of natural selection in the former than in the latter case.

Here is a field for coöperative work for the botanists of the American Experiment Stations.

We know that we have, in Indian corn, a plant of an exceedingly plastic organization, or, as perhaps we should say, a plant that is still in the midst of a variable period. We now know that all of the principal races of maize—the dent, flint and sweet corns, as well as the podded, rice, and Brazilian or flour corns—existed in America at the time of the discovery. Several of these races were grown at that time in what is now the northern United States by the nomadic American Indians in their crude agriculture. Through the early migration of Indian races up from Peru and Mexico to the southern United States, and the wandering habits of the northern tribes, the rapid acclimatization of sub-races took place under the stress of natural selection. What the American native races began, we are now, with more intensive and scientific methods and more applied diligence, seeking to carry on. We have now dozens of forms, types, varieties, sorts, or whatever you may choose to call them, of the single race of dent corn alone, and the process of rigid scrutiny to which corn is being subjected in all quarters is resulting progressively in the still further and more minute sub-division of these varieties into local strains of special value.

Let us now consider a few instances of supposed acclimatization which may well represent to our minds many similar cases of which we have knowledge, and in which there is ascribed to climatic influences that which our present knowledge must relate to an entirely different cause.

Darwin cites a case of supposed acclimatization of Indian corn, mentioned by Metzger in 1841, which he considers, "the most remarkable instance known to me of the direct and prompt action of climate on a plant." The facts are as follows: Metzger obtained seeds of several varieties of corn from America and cultivated them in Germany. In the case of one variety, called Tuscarora corn, obtained from St. Louis, he found that, in the first year, plants grew to a height of twelve feet and ripened but a few seeds.

The lower seeds of the ears were like those originally planted, but the upper seeds had become somewhat changed. In the second year's planting, the corn grew to a height of but nine or ten feet, and more seed ripened. The "dent" of the original corn had almost vanished, the original white color had become darker, some of the seeds even being yellow, and the rounded form of the kernels resembled that of the local flint corn grown in the neighborhood. In the third generation there was almost no resemblance to the original parent variety, and by the sixth generation the corn could no longer be distinguished from that commonly cultivated near Heidelberg, except by its somewhat more vigorous growth. Metzger hazards no suggestion as to the cause of this supposed transformation. Professor de Vries, however, the most eminent living authority on matters connected with the breeding and evolution of plants, discusses this case at some length in his recent work on the *Evolution of Species by Mutation*. According to his view, with which all who understand the habits of corn will coincide, we have, in this supposed case of acclimatization, simply a series of extensive cross pollinations going on between the introduced American white dent and the yellow flint corn grown in its neighborhood. Since the American corn was a late variety, few seeds matured the first year, and of these many had been produced as a result of crossing with the yellow flint. These hybrids in the next year naturally were more numerous than the pure-bred stock, and inasmuch as they matured earlier than the progeny of the pure white dent variety, the hybrids, of course, ripened more seeds than did the others; and in addition, they in turn had experienced, in large degree, a second pollination from the local flint variety. This process repeating itself year after year, it is not surprising that in the course of six or seven years the characters of the American white dent corn should have disappeared in most of the progeny of these successive crosses. Evidently, neither Metzger nor Darwin appreciated the readiness with which the races of Indian corn can be crossed.

Another case of supposed transformation due to climatic influences is cited by a French writer upon wheat culture, Eugene Risler. A variety known as Galland wheat was planted upon his land at Calèves on the lake of Geneva in Switzerland. The heads of this variety were bearded. In the second year, half the heads had lost the beards, and by the third year the beardless heads were in

the great majority. The kernels, likewise, had become modified, having become horny instead of mealy in their fracture. Risler undertook to determine the cause of this metamorphosis by growing in the same field alternate rows of Galland wheat and the beardless wheat, into which it had apparently changed. It turned out that the former suffered more from the cold of winter and ripened from one to two weeks later than the latter. These differences sufficed to explain the evident fact. His original Galland wheat had in reality been a mixture of two varieties, one of which survived and the other perished as a result of successive years of exposure to new conditions.

W. Rimpau, an eminent German authority on cereal growing, investigated the supposed metamorphosis of Rivett's Bearded wheat, a Scottish variety which apparently, in a few years after introduction into Saxony, became changed into the beardless forms locally grown. Rimpau found that by carefully selecting seed from the bearded plants he was able to keep the variety just exactly as it had been maintained originally in Scotland for over one hundred years. Since, however, as Rimpau says, "It suffers injury from the winter more than any of the other wheats locally cultivated by us, and ripens later in the spring than the other varieties; it is readily conceivable that chance intermixing of seed, which is almost unavoidable in farming operations on a large scale, and especially through the application of stable manure, would result in the relatively more abundant increase of the latter and that they would soon get the upper hand."

We have, then, to conclude as follows: Most of the reported cases of acclimatization, particularly of annual plants, are really misinterpretations, and in most cases the changes ascribed to climatic influences are due either to the effect of inter-crossing of local races or to the existence of more than one variety in the originally introduced seed. Where this is the case, one of the admixed varieties, which on account of its inadaptability, remained always suppressed in the original locality, may perhaps find more favorable conditions in the new location than the seed of the dominant sort, and hence may replace it year by year through the process of natural selection.

There seems, however, to be abundant opportunity to test, in Indian corn, the real influence of climatic factors as distinguished from all others. No wild form of the species being known, we are

unable to surmise whether our present corn races came from one or from many species. We have, therefore, no sort of an idea how the process of evolution has gone on in the group. We do know that we find a most tremendous variation in type, from varieties maturing their stalks at sixteen inches to others, the stalks of which attain a height of sixteen feet. We have a variation in the vegetation period of from less than ninety days to over seven months. We have a most bewildering array of forms and colors in the kernels. We find that by persistent and rigid selection we can breed almost any type of stalk, ear or kernel desired, within a very extensive range of possibilities. Much has been done of late years in America toward the improvement of corn with respect to the increase of the protein and oil content. There remains still to be conducted a series of acclimatization experiments whereby it shall be endeavored to carry the range of this all-important cereal still farther north, and to this end it is hoped that some of our northern American and Canadian experiment stations will be found to coöperate.

H. F. ROBERTS.

REPRESENTATIVE GOVERNMENTS IN THE COLONIES.

THE object of the reading which led to this article was to find in the case of each colony the beginning of government by voice of the people and to trace the development of the representative system. This system was maintained by the colonists as a natural right, through unjust legislation by Parliament and cruel administrations of royal governors; and finally, in the form of the Continental Congress, gave voice to the charge against George III that, "he dissolved representative houses and refused to cause others to be elected, whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise," and stated to the world as a self-evident truth "that governments derive their just powers from the consent of the governed."

During the reign of James I, two joint-stock companies were formed for the colonization of the eastern coast of America, known then as Virginia. These companies were designated as the First Colony and the Second Colony. The limits of territory belonging to each were outlined, leaving a zone of three degrees between the grants. This zone was open to settlement by both companies, providing the settlements were one hundred miles apart.

The result was the division of the Virginia territory into three strips or zones, within each of which were settled several English colonies, by an entirely different course, however, from that contemplated by King James. The colonies in each group resemble each other closely while the groups show many points of difference.

It is thus possible to gain a fair knowledge of the political life of a group by studying the government of one colony. Let us take, as examples, Virginia in the South, Massachusetts in New England, and Pennsylvania in the middle group.

We must expect the treatment of a wholly new problem, such as colonial government presented to Parliament to be experimental and to need frequent modifications.

Virginia was governed for two years by a resident council of thirteen, one of whom acted as president. Superior to this was a council of thirteen in London. The members were appointed by the king, and this council supervised the affairs of both the London and Plymouth companies.

Fiske says, "The doctrine of the divine right of kings was dear to the heart of James Stuart, and his aim in life was to impose it upon the English people. It is well that he could not foresee the result or he would have been slow to establish a government which, though limited to a royal council at first, was destined to become a power that developed a new commonwealth and aided materially in enlarging the liberties of his subjects at home."

In 1609 a governor was added to the resident council, and in 1612 the London council became a body of stockholders. The stockholders granted the colony a representative assembly called the house of burgesses. This assembly was first convened in June, 1619, in the little church at Jamestown. It was composed of the governor, council, and two burgesses from each of eleven local constituents known as cities, plantations, and hundreds. The effect of this convention was to restrict the power of the governor.

The local organization in Virginia was the county, the officers being appointed by the governor. Governor Berkeley, in 1671, reported twenty counties. At this time the burgesses had become county representatives. The number of councillors had increased to sixteen.

It is in the Salem settlement afterward chartered as the Com-

pany of Massachusetts Bay in New England, that we see the first example of colonial government begun under Charles I. The week he dismissed his parliament to begin his absolute government he granted the charter remarkable, not only for the liberal government it established, but for the fact that it was almost immediately transferred to New England by the members of the company, who now became settlers in the colony.

Under the charter the whole body of freemen was to elect annually a governor, a deputy governor, and eighteen assistants, who were to meet monthly as an executive council. They also met four times a year with the freemen, or church members, in Quarter Court and once in General Court. The primary assemblage became inconveniently large, so in 1630 the assistants were given the power to elect the governor and deputy governor and also to make laws. They held office until removed by the freemen. The government thus became almost an oligarchy, and there followed a protest against the payment of taxes levied by the assistants. This resulted in the establishment of a house of representatives. Watertown objected to paying a tax of eight pounds, arguing that people who "submitted to taxation without representation were in danger of bringing themselves and posterity into bondage." The next general court provided for a house of representatives on the plan of the English Commons. Each town was given two deputies and the governor and assistants were also members.

For a time the election of the governor and deputy governor was resumed by the freemen, but soon that became one of the duties of the representatives. Voting by ballot was introduced in 1634. Ten years later a quarrel between the assistants and deputies resulted in the division of the colonial parliament into two houses.

In 1691 the new charter reserved to the king the right to appoint the governor, deputy governor, and secretary. The deputies were still elected by the people but each year the assistants and deputies elected the new board of assistants.

The local government in this, as in all the New England colonies, was administered by the towns. Some of the officers were elected annually, others for a limited time. Each man was entitled to speak in the town meetings, and nothing of interest to the inhabitants seemed too trifling to escape notice.

The constitution drawn up by Penn for his colony gave to the

people the right to elect the members of the council and also deputies to a representative assembly. This plan had been used in West Jersey while it was under the control of the Quakers. At first the council was composed of "seventy-two persons of most note for their wisdom, virtue, and ability." The assembly began with two hundred members, provisions being made for increasing the number to five hundred. Penn's idea was to allow the council to originate laws which the assembly should confirm; but in ten years the assembly had assumed full law-making powers, while the council had become a mere board of advisors to the governor. The proprietor reserved the right to appoint the governor.

In 1701 the colony was given a new frame of government. Pennsylvania, called the province, and Delaware, the territories, were each divided into three counties. The counties were controlled by governing boards and were the units of representation in the assembly. Four men of "most note for virtue, wisdom and ability" were elected "out of each county." This number might at any time be increased by the governor and assembly. The towns had no local government, but were the administrative subdivisions of the county.

Each colony in 1750 was governed by two sets of organizations—the general, or colonial, and the local, which was the town, county, or a combination of the two systems. These forms were founded upon English customs, but were modified to meet the conditions of America. The colonial governments were always superior to the local governments but, on the other hand, no colonial officer was given charge of local affairs. Thus the two systems were kept separate and, as the crown limited the power of the government, the local organization assumed greater powers.

The governors in eight of the colonies were by this time appointed by the king. Gradually the assemblies took the executive power, often giving it to the officers of their own election. The inter-colonial wars had proved to the colonists the possibility of uniting their military forces. It is not surprising, then, that, in the struggle of the English commons against the determined efforts of George III to reestablish the king's prerogative, the colonies in America are found in the party contending that it is the right of the English people to govern themselves.

HELEN B. THOMPSON.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD.....Ellsworth
HON. J. W. BERRY ['83]Jewell City
HON. J. O. TULLOSS ['99].....Sedan
HON. A. M. STORY.....Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Judge A. M. Story, of Manhattan, is one of the newly appointed Regents of the Agricultural College. Hoch always did like a good Story.—*Clay Center Times*.

As is usual at the close of a winter term, many students returned home to assist in the spring work on the farm; others for a short visit with home-folks.

President Nichols planted a number of shade trees and evergreens and built a system of cement walks this week on his new home lot, greatly improving the general appearance of the villa.

Spring term begins Tuesday, March 28, and closes Thursday, June 15. Examinations for admission will be held Monday, March 27. The mid-term examinations will be held on Saturday, May 6.

Mrs. Calvin, professor of domestic science, with a number of her students, arranged with the Union Pacific to go to Topeka to visit a number of industrial establishments. They left here this morning at 5:30. A rate of one fare, \$1.55, for the round trip was made by the railroad.

Thursday afternoon the members of the College band met at the Music office and, with Mr. Geo. Wright as spokesman, on behalf of the band, presented the leader, Mr. R. H. Brown, a beautiful solid ivory baton, with silver mountings, and his name engraved on it. Mr. Brown says he will try and put the baton to good use the coming term.

Durell and Cummings, proprietors of the Oxford hotel, at Topeka, wrote to the *Daily Republic* last week: "The Oxford hotel recently had the pleasure of entertaining the students from your city, and the management cannot pass the opportunity to publicly thank them for their deportment and gentlemanly conduct during their stay, reflecting both credit to your city and honor to themselves."

Cadet Captain Wm. W. Buckley, member of the senior class, has been designated by the Secretary of the Navy to take the examination for second lieutenant in the U. S. Marine Corps. He will report in Washington, D. C., on May 15, for the examination. This position carries with it a salary of \$1500 a year, with allowances, increase of pay, and promotion about parallel to that of the U. S. Army.

The annual senior-junior reception was held on Friday evening, March 17. Despite the fact that a gentle spring rain was falling, a reasonable number of each of the classes assembled in Kedzie Hall, between the hours of 7:30 and 9 o'clock, to do honor to St. Patrick and the Emerald Isle.

A CARD OF THANKS.—We wish to express, through the *Daily Republic*, our hearty thanks to Professor Eyer, of the College, for the use of their very excellent lantern, last evening, and also to Mr. R. A. Carle, a member of the senior class, for so kindly coming to the Post and operating the lantern for us. He is certainly a student of electricity in the practical sense of the term.—I. H. MASTERS, Gen. Sec'y, Y. M. C. A., Ft. Riley, Kan.

An offer of \$1000 has been received by Secretary McLean for the Y. M. C. A. building fund. This offer comes from some eastern party through the International Committee and is upon the condition that an additional fund of \$5000 be raised in three months. Dating the offer from the time of Mr. Hurry's meetings, only two months are left, but \$1500 are pledged now, leaving \$3500 to be raised. Students leaving College for the spring term should miss no opportunity to swell the fund.—*Students' Herald*.

The following is the College baseball schedule for spring term: At Manhattan—Chicago, April 6; Baker University, April 11; Lindsborg, April 26; Friends' University, May 2; Kansas University, May 6; Normal, May 11; Washburn, May 13; Ottawa University, May 17; Highland Park, May 26; St. Marys, May 30; Haskell, June 3. Out-of-town games—Baker, April 19, at Baldwin; Kansas University, April 20, at Lawrence; Washburn, April 21, at Topeka; Normal, May 19, at Emporia; St. Marys, May 20, at St. Marys.

The Board of Regents of the Agricultural College is in session at the College. This is a special meeting for the purpose of establishing a public park at the old Ft. Hays reservation, now being used by the State Agricultural College for experimental purposes and a branch school. When the federal government ceded the reservation to the State it was specified that the State was to establish and maintain a public park within five years, which time expires March 28, 1905. The park is to be located near the edge of Hays City.—*Daily Republic*.

The Board of Regents held a short session on Thursday afternoon and Friday, March 16 and 17. Regents Tulloss and Friend were absent. Regent G. P. Griffith, of Hays, was present for the first time and expressed great satisfaction concerning the condition of the College. Regent Fairchild addressed the students in chapel on Friday morning. By the way, several of the strongest papers of the State have lately published endorsements of Mr. Fairchild for the position of State Superintendent of Public Instruction. We do not wish to be political but feel like "butting in" to make the remark that a stronger and cleaner man can not be found in Kansas.

The Farm Department is again seeking men for the next corn-judging contest at Chicago. Only the best men will be selected, and it is hoped they will be successful and that Cook trophy will make its home at this College for another year.—*Daily Republic*.

While the recent rain is just what the baseball diamond needed to put it in first-class shape, the break in practice is looked upon as unfortunate by the men trying for places on the K. S. A. C. team. The announcement that the Chicago League team would cross bats with the College team has given players of all degrees, good, bad and indifferent, a desire to make the team and win the distinction of having played against the top notchers. Coach Booth is delighted with the vim the men put into their work and has several candidates working for all positions. New seats are being built and the grounds placed in the best possible shape to accommodate the patrons of the game, and from the present outlook the team will be better supported this year than ever.—*Daily Republic*.

The elective class in animal husbandry has been engaged in the study of location and construction of farm buildings, sheds, and pens, with regard to natural protection and sanitation. Special attention has been given to plans for horse stables, cow barns, sheep and hog houses, and poultry houses. Each student was required to draw up plans and specifications and estimates on a horse barn, a cow barn, and pens for sheep and swine. Sewage disposal plants were also discussed. The last half of the term has been taken up with the management and care of young animals, the slaughter, cutting and storage of meats, and discussion of different coöperative farm concerns. The work of the spring term will consist of advanced pedigree work and stock breeding.—*Daily Republic*.

On March 20 the agricultural students held their third annual stock-judging contest. The contest was open to all agricultural students, and each student was required to pass judgment on ten classes of stock. Last year the business men of Manhattan gave gold medals to the winners, and this year prominent swine breeders of the State were asked to contribute to the work. Five breeders offered fine specimens from their respective herds. The results of the contest were as follows: First, R. R. Birch; second, F. L. Williams; third, G. O. Kramer; fourth, R. W. Hull; fifth, A. C. Plake; sixth, C. Lambert; seventh, M. D. Snodgrass; eighth, J. S. Montgomery; ninth, J. R. Garver; tenth, H. A. Ireland; eleventh, C. J. Creighton. The following is the rank by classes and the average of men entered from each class: Freshmen first, with two men entered; seniors second, with two men entered; specials third, with six men entered; juniors fourth, with six men entered; sophomores fifth, with nineteen men entered; second year short course sixth, with two men entered; dairy course seventh, with three men entered; first year short course eighth, with twenty-eight men entered.

ALUMNI AND FORMER STUDENTS.

J. E. Payne, '87, is the author of an article on "Growing Alfalfa on the Plains" which appeared in the last number of the *Farmer and Breeder*.

H. V. Forest, '00, visited the College early this week. He has located at Lyons, where he will erect and manage an electric light and power plant, in which he also owns an interest.

O. I. Purdy, '99, is now with the *Freeborn County Times*, of Albert Lea, Minn. He has a good position and enjoys the climate of the region very much in spite of the fierceness of the winter.

The last bulletin of the Dunn County School of Agriculture at Menomonie, Wis., K. C. Davis, '91, principal, contains a number of illustrations showing the equipment and character of work done.

V. L. Cory, '04, called recently at the College on his way from Washington, D. C., to Dallas, Tex., where he will have charge of some experiments under the direction of the Bureau of Plant Industry. He spent the winter in Washington.

Eusebia (Mudge) Thompson, '93, has been appointed county superintendent to fill out the remainder of the term to which her late husband was elected, which expires next May. Mrs. Thompson assisted Mr. Thompson in the office, and its duties will be carefully performed.

E. H. Webster, '96, Chief of the Dairy Division of the Bureau of Animal Industry, made a short visit at the College this week on the way to Randolph, where he will join Nora (Fryhofer) Webster, '95, and their little daughter. They proceed at once to Washington, D. C., where they will make their future home.

Capt. E. A. Helmick, third-year student in 1884, is still at Springfield, Mass. He has been in great demand for addresses on the Philippines and has lectured in Boston and at Wellesley on this subject. His wife, who was Lizzie Clarke, second-year student in 1884, has also favored a number of schools, societies and clubs in the same manner.

D. M. Campbell, special student last year, visited College friends this week. He has just completed the junior year in the Kansas City Veterinary College and expects to complete the course there next year. He will continue to assist in the chemical department there also. He gave us a number of interesting items concerning alumni of our College. J. H. Oesterhaus, '01, and F. L. Schneider, '02, were graduated on the 14th instant. Mr. Oesterhaus will remain there about a month, assisting the proprietors of the College in their practice, when he will probably locate somewhere. R. F. Bourne, '03, is in charge of the canine hospital during the vacation. He expects to graduate next year. B. W. Conrad, '95, completed the first year's work and will practice with his brother at Sabetha, Kan., this summer. Dr. A. T. Kinsley, '99, is regarded as one of the most valuable men there. He made a speech at their banquet recently.

Historical Society

VOL. 31

NO. 27

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894. L

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.).....	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg).....	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami).....	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B. S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B. S. (K. S. A. C.).....	Executive Clerk
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., APRIL 1, 1905.

No. 27

IMMUNIZING OF NORTHERN CATTLE AGAINST TEXAS FEVER.

DEFINITION.—Texas fever is a specific fever of cattle and enzootic during the warm seasons in the low, malarious ground and wooded or uncultivated districts of different countries, caused by a protozoan (*Pirosoma bigeminum*) in the blood and red globules, which is conveyed from animal to animal by ticks (*Boophilus annulatus*) and leading to engorgement of the spleen and liver, and destruction of red globules and haemoglobinuria. (Law.)

Texas fever is found in the Southern States south of what is known as the quarantine line, which is an imaginary division of the United States, running from the Pacific to the Atlantic ocean; it is established by the Bureau of Animal Industry, Department of Agriculture, indicating that the country south of this line is inhabited by ticks, and Texas fever is therefore prevalent. The winters, as a rule, are not cold enough to kill the eggs of the ticks that are deposited in the fall, whereas north of the Texas fever quarantine line the winters are sufficiently cold to destroy all ticks and their eggs, and consequently the disease is not prevalent there.

Beginning at the Pacific coast, the quarantine line starts near the 37th parallel, on the western coast of California, runs in an irregular direction east and south to the 35th parallel, on the western boundary of Arizona, then follows the Colorado river south to the southern boundary of Arizona, eastward along the southern boundaries of New Mexico and Arizona to El Paso, Texas, southeast along the Rio Grande river to the 29th parallel, gradually northeast through Texas to include some of the southern portion of Oklahoma to the southern boundary of Kansas just east of Arkansas City, then eastward following the southern boundary of Kansas and Missouri to the Mississippi river; from there in an irregular course through the middle of Tennessee to the Georgia boundary, then going a few miles south into the northern part of Georgia,

where it runs eastward to the western boundary of South Carolina, thence in a northeasterly direction along the western boundary of that state, and through the western part of North Carolina and Virginia, as far north as the James river, and strikes the Atlantic coast a few miles south of Norfolk, Va.

HISTORY.—Before anything was known of the true nature and cause of Texas fever it was the common experience of men shipping cattle from Northern States to the South to have them die, as soon as they were turned out to pasture, or on the range with the southern cattle. Thus the shipment of northern cattle was not profitable and, as the cause of death was not then known, it held in check the importation of cattle to the South. However, investigators of the Bureau of Animal Industry, and Dr. M. Francis of the Texas Experiment Station, and Dr. J. W. Connaway of the Missouri Experiment Station, began investigations about the same time as to the causes, and lines of treatment, especially as to immunizing northern cattle against this disease. The methods and results were not well understood until 1898, but since that time most of the veterinarians of the Southern Experiment Stations have carried on extensive experiments in regard to immunizing northern cattle.

The death rate among northern cattle exposed to ticks in the south without inoculation, is from 60 to 90 per cent. This rate has been reduced to $7\frac{6}{10}$ per cent in 4750 head inoculated at various experiment stations, and it is highly probable that hereafter the death rate among inoculated cattle will not exceed 5 per cent. (Nesom.)

Inoculation is a process by which northern cattle, or those animals that are raised free from ticks, are rendered immune to Texas fever, and is accomplished by injecting hypodermically into each animal from one to three cubic centimeters of fresh, defibrinated blood, taken from an immune animal.

OBJECT.—The principal object of inoculation in this country is to immunize northern-bred cattle so that when they are shipped south and allowed to run in pastures infested with the cattle tick they will not contract the fatal form of Texas fever. It is also found to be applicable to cattle raised south of the quarantine line, provided they have never carried ticks and have not acquired immunity in the natural way.

AGE OF CATTLE.—So far it has been found impractical to inoc-

ulate cattle over two years old, and it is better if done before one year old. For those animals that can be immunized before they are shipped south it is much better to do this when they are quite young; about six months of age. From the time calves are weaned up to the time they are eighteen months old may be regarded as a suitable age limit.

TIME OF YEAR.—Inoculation may be done at any season, but the best time is in the late fall, winter, or early spring, when the effects of the inoculation are less than in the summer. This also enables the owner to place the cattle on pasture early in the spring, when the ticks do not produce such a severe form of the fever as in mid-summer or late fall.

PLACE OF INOCULATION.—In the states just north of the quarantine line, where a supply animal can be obtained, it is better to inoculate the animals and have them immune before they are shipped south. However, in the Northern States, where it is impossible to obtain a supply animal from which to obtain the blood, it is necessary to ship the cattle south, under strict precautions, and inoculate them on their arrival there.

PRECAUTION.—Precaution should be taken in shipping cattle south before immunizing. They should be loaded, unloaded and handled with great care so as to insure their arrival in good condition. They should be shipped in thoroughly disinfected cars and never, after crossing the quarantine line, should they be unloaded into tick-infested pens. However, if it becomes necessary to unload them enroute or at destination, or to drive them over roads where southern cattle have been driven, some precautions must be taken to prevent seed ticks getting onto them. Before leaving the cars the legs and under parts of the body should be thoroughly oiled or larded so that the ticks cannot climb upon them while they are being led to their stables. On arrival at the farm they should be put in barns and lots not used for southern cattle, and should not be allowed access to southern pastures where native cattle have been for three or four months previously. To sum it up, every possible precaution should be taken to prevent the cattle getting ticks on them before they are inoculated, and for a month afterward.

METHODS OF INOCULATION.—Supply Animals.—After an animal has passed through the disease or is able to carry the cattle tick without any bad effects, there is present in the blood of such

an animal the protozoan, and it has been found that by taking some of the blood from the immune animal and injecting it, in small quantities, into susceptible animals that it produces a mild type of the disease and renders the animals nonsusceptible to further attacks by the cattle tick. The supply animal is confined in some way and the hair clipped for a space of four or five inches in diameter over the jugular vein on the anterior and lower part of the neck. The neck is corded so the vein will stand out prominently, and the fresh blood is withdrawn with a large hypodermic syringe or trochar and cannula into a closed sterilized vessel. The blood is then whipped or beaten with a sterile rod to remove all fibrin. It is then ready for use, and should be used immediately and not allowed to stand over two hours at the longest.

INOCULATION.—The animals should be in good health and condition. When the owner has plenty of time it is best to make two inoculations, the first time using a small amount, 1 cubic centimeter, of the defibrinated blood, and in forty to sixty days make a second inoculation, using three cubic centimeters of the blood. However, when the two inoculations are not convenient, the one of one cubic centimeter of the blood may be sufficient, if care is taken to allow the animals to gradually become infested with the ticks.

The animals to be inoculated are secured in some way and the defibrinated blood is injected under the skin at any convenient point, such as the side of the shoulder, neck, or hip, but the region just anterior to the shoulder is preferable. Any good hypodermic syringe, graduated into cubic centimeters, with a strong needle, may be used.

EFFECT.—The inoculation generally takes effect in from eight to twelve days, and is shown by the animals refusing food, standing with the back arched, ears drooped, nose dry, breathing rapid, rumination suspended, constipation marked, and a general expression of suffering. There is also a high temperature, which is a positive indication of a successful inoculation. When lying down the head will be extended forward on the ground, or laid on the hind feet as if asleep. The animals recover from the effects of the inoculation in from thirty to sixty days, but there are conditions which may vary this, such as the virulence of the blood and the amount injected, age, condition and care of the animals.

It has been found that cattle do not thrive for from two to six

months, and sometimes longer, after inoculation, nor do they take on flesh as well as they otherwise would. This may be explained somewhat by the presence of ticks on cattle, which tends to lower the vitality, and also by changes of climate and conditions with changes of location.

TREATMENT OF SICK ANIMALS.— In cattle under a year old little treatment is necessary if they are carefully managed. When the fever first appears it is best to cut down the feed and give from one to two pounds of salts, dissolved in water, as a drench varying the dose according to the age and size of the animal. The salts may be repeated once or twice until the bowels act freely. Keep the sick separated from the well, protect them from heat and cold, keeping them in well-ventilated quarters and allowing them an abundant supply of fresh water.

EXPOSURE TO TICKS.— Animals do not acquire a complete immunity after being inoculated, and it is necessary to expose them to ticks to complete the process. They should be protected from the ticks, however, until they recover thoroughly from the effects of the inoculation, and then gradually exposed to the ticks. The best time to expose such animals is in the early spring, when the ticks do not seem to be as virulent or as plentiful as they are in the late summer or fall.

ROB'T. J. FOSTER.

POPULAR ETYMOLOGY.

A BOY friend of mine one day asked his mother why the Rev. X always said "Oh Grandfather" when he prayed while the other preachers said "Oh Father." A Sunday-school class heard "Oh Grandfather," though the Rev. X had begun his petition with the words, "Oh grant, Father." A certain little girl wondered why the whole Sunday-school sang "Bringing in the Cheese." A more forcible, if less elegant, example was furnished by a four year-old boy who one day informed his mother that he had seen a *stunk*. I know of another case where this same amusing error occurred. But not among children alone do we observe such blunders. A German girl of twenty called windows *wind-doors*. And a waitress in a first-class hotel not long since enquired whether one of the guests cared for *bullion-soup*.

All of the above illustrations show a tendency in the development of language. For "men are but boys grown tall," and a nation viewed from a philological standpoint is nothing more than

an aggregate of individuals. Philologists, however, pay little attention to such cases as the above, except as illustrating method, unless they have been accepted by such a large proportion of the people that the new forms are taken up in the literature. It is with such forms as these, taken mainly from English and German, that this paper has to deal. The forms that have arisen through popular etymology may be divided roughly into two main groups—native words and importations. It is my purpose to present first a few native English words which have undergone the transformation mentioned.

Bridegroom should really be *bride-goom*, the second part of the compound having had originally nothing to do with *groom* "servant." The Anglo-Saxon form is *bryd-guma* "bride's man," corresponding to German *Brautigam*, Dutch *bruidegom*, Old Norse *bruthgumi*, Swedish *brudgum*. The second element is cognate with Latin *homo* "man."

Cold-slaw has secured a firm footing in our language beside the etymologically correct form, *cole-slaw*. The first element is *cole*, cognate with Scotch *kale*, *kail* and German *Kohl* "cabbage," all of which are early borrowings from Latin *caulis* "cabbage." The second part of the compound is seen in *slay*, German *schlagen* "to strike." *Cole-slaw* is therefore "chopped cabbage," and the new form *cold-slaw* arose from the fact that this preparation is served cold.

Lapwing had originally nothing to do with *wing*, for earlier forms were Middle English *lappe-winke* and Anglo-Saxon *hleape-wince*, as if compounded from *hleapan* "to run" and *wince* (cf. English *winch*) "one who turns." However, as there occurs an unexplained older Anglo-Saxon form *laepaeuincæ* the form *hleape-wince* may itself be a case of popular etymology.

Rams-foot "a plant-name" shows a peculiar transformation. The Anglo-Saxon form was *hræfnes-fot*, i. e., "raven's foot." The form *hræfnes* became later *hræmnes*, then *rammes*, a form which was not understood and for which the similar form *rames*, *rams* was substituted. So the raven became a ram.

Shame-faced is a corruption of Middle English *shame-fast* "modest" from Anglo-Saxon *scam-fæst*, literally "firm in shame," i. e., "modest." Cognates of both parts of the compound occur in other Germanic languages, e. g., German *Scham* and *fest*.

The *slow-worm* was not so named because it was slow in move-

ment. The Anglo-Saxon form is *sla-wyrm*, i. e. "slay-worm," "snake that strikes." Anglo-Saxon *slaw* "slow" became Middle English *slow*, with which Middle English *slo* (from Anglo-Saxon *sla*, see *cold-slaw* above) when preceeding a *w* became identical in sound. As the former still had a living meaning independently, its form and meaning took the place of *slo* in the compound.

Yellow-hammer contains an *h* which is unoriginal. *Hammer*, *ammer* answers to Anglo-Saxon *amere* "a small bird." The Old High German form was *amero*, giving rise to the New High German forms *Gelb* ("yellow")-*ammer*, *Gold-ammer* and *Emmerling* "yellow-hammer," with the Middle Dutch correspondence *emmerick*. The change from *yellow-ammer* to *yellow-hammer* needs no explanation for those who have heard the *hammering* of the bird in its search for food beneath the bark of trees.

Similar changes take place in German though here the developments are mainly in dialect forms of literary words. The variations are often very numerous. The changes which have taken place in the single word *Falter* "butterfly" well illustrate the point.

Falter is a simplification of Middle High German *vivalter* which in turn is derived from Old High German *vivaltra*. Corresponding to *vivaltra* we find Old Saxon *fifoldara* (Dutch *vijsfouter*), Anglo-Saxon *fifealde*, Old Norse *fifrilde* (with unoriginal *r*). Old High German *vi-valtra* is made up of the reduplicative syllable *vi* and *valtra* "folder," the butterfly being so called from the motion of its wings while it is at rest. Reduplication was no longer a living process after the development of the Germanic dialects into languages, therefore the action of popular etymology in such cases. A few of the forms in which *Falter* occurs are as follows: Swiss *fifaltere*, *pfif-falter*, *zwi* ("two")-*falter*, Bavarian *feifaltr*, *faier* ("fire")-*faltr*, *fein* ("fine")-*fatr*, *wein*, ("wine")-*falter*, *bein* ("leg")-*faltr*, Swabian *bau-faltr*, Austrian *wein-faltr*, etc.; still other dialect forms would be translated into the literary language as *Zweigs* ("twig")-*falter*, *Zweifels* ("doubt")-*falter*, *Zweisels-falter*, etc. Popular etymology was at work in other Germanic languages also. The inorganic *r* of the Old Norse form has already been referred to, and in Anglo-Saxon *fifeald* "butterfly" the second *f* was doubled, the word thereby assuming the same form as *fif-feald* "five-fold."

An interesting hybrid-form is English *pole-cat* in which *pole* was originally French *poule* "chicken," still seen in English *poultry* and *pullet*.

A second group of words which have fallen under the influence of popular etymology embraces borrowings from foreign languages. This group appears to be much larger than the one just treated. A few of the words which have been taken over into English and then changed through the workings of popular fancy are given below.

Camp-fire "camphor," still heard now and then, is a later form of *camphire* from French *camphre*, derived from Low Latin *camphora*. But the last form is from Arabic *kafur* (with which compare Sanscrit *karpura*) "camphor," and this in turn is from Malay *kapur* "chalk" for *kapur Barus* literally "chalk of Barous" (in Sumatra), a name for camphor.

Cow-herd was once rather widely used for the correct form *coward*. This is identical with French *couard* "coward," Old French *couard* "a hare, a coward" corresponding to Ital. *codardo* "coward." The word originally meant the "bobtailed" hare; it is derived from Lat. *cauda* "tail" with the Germanic suffix *hard*.

Cow-cumber has given way to the better form *cucumber*. The Middle English form was *cucumer*, from *cucumerem*, objective case of *cucumis* "cucumber."

Cray-fish and *craw-fish* did not originally contain the word *fish* as their second element. The Middle English form was *crevisse*, from Old French *crevisse*, *escrevisse* (Modern French *ecrevisse*), which in its turn is a borrowing from Old High German *crebiz* (New High German *Krebs*) "crab," allied to German *Krabbe* "crab."

Hope in the phrase *forlorn hope* does not properly belong here since no change of form has taken place, but it nevertheless furnishes an illustration of the idea involved. The original phrase was *lead a forlorn hope* with the meaning "lead a lost (or doomed) band of men." *Hope* is a borrowing from the Dutch and is cognate with German *Haufen*, English *heap*.

Lanthorn for more usual *lantern* owes its form to the fact that horn was formerly used for the sides of lanterns. Middle English *lanterne* is a borrowing through French of Latin *lanterna*, *lanterna* "lantern." But *lanterna* is from *lamterna*, a development from *lampterna*, borrowed from Greek *lampter* "a torch," the latter being related to *lampein* "to shine." English *lamp* is from Greek *lampas* "torch" likewise related to *lampein*.

Lanyard "a certain small rope in a ship" was formerly spelled *lannier*, Middle English *lainere* from French *laniere* "a narrow

band of leather, a hawk's leach." The word is probably identical with English *lanner* from French *lanier* "a kind of hawk." In this word we find the suffix *ier* becoming *yard* through association of *lannier* with *yard-arm*, *yard*.

Sparrow-grass is the popular form of *asparagus*, a borrowing from the Latin. The ultimate source is supposed to be Persian from which it reached Latin through Greek.

Though the changes produced by the workings of popular etymology on borrowings into English are of unusual interest, the German language boasts of many forms not less curious. A few of these forms follow.

Armbrust "cross-bow" as if from *Arm* "arm" and *Brust* "chest" is a corruption of Latin *arcuballista*. Compare English *arbalist*, French *arbalete*, Italian *balestra* all borrowings from Latin *arcuballista* "ballista provided with a bow, catapult."

Karfunkel "carbuncle" (precious stone) shows the Middle High German form *karbunkel* borrowed, as are also English *carbuncle* and French *escarboucle*, from Latin *carbunculus* "a small coal." *Karfunkel*, then, has nothing to do with *Funkel* "spark."

Maulwurf "mole" has the Middle High German form *moltwerf*, which goes back to Old High German *moltwerf*, *moltwurf* "mole." *Molt* is the same as English *mould* "earth," and *werf* is from *werfen* "to throw" (allied to English *warp*). The "soil thrower" shows the corresponding forms Old Norse *mold-varpa*, and Middle English *moldwerp* "mole." From Old High German *moltwerf* were developed through popular etymology Middle High German *muwerf* (as if from *mu* "heap"), and the New High German dialect words *Molt-wurm* (as if "earth-worm"), *Maul-wurm* ("mouth-worm"), and *Maul-wulf* ("mouth-wolf"). *Maul-wurf* is made up of *Maul* "mouth" and *wurf* "throw" as if the mole threw earth with his mouth!

Renn-tier "reindeer" is supposed by most Germans to have its first element from *rennen* "run." Forms in other languages are Dutch *rendier*, Danish *rensdyr*, French *rangier*, Italian *rangifero*. *Renn-tier* does not occur in Middle High German. It is a late borrowing with the forms quoted above from Old Norse *hreindyre*. Anglo-Saxon has the form *hran* (corresponding to Old Swedish *ren*, Old Norse *hreinn*) "reindeer," but the Middle English form is the compound *raynedere*. The first element of *Renn-tier* was originally "reindeer" and unrelated to *rennen*.

Suendflut "deluge" as if from *Suende* "sin" and *Flut* "flood" has the Middle and Old High German form *sinvluot* really "the great flood." The first element of the word is seen in German *Sin-gruen* "ever-green," Gothic *sin-teins* "daily, continuing," Anglo-Saxon *symble* Old Saxon *simbla*; Old High German *sinblum* "always;" further in Latin *sem-per* "always" and means "great, lasting."

Viel-frasz "wolverine" is only apparently from *viel* "much" and *Frasz* "animal's food." Its original is Norse *fjallfress* "mountain-bear." The wolverine is popularly supposed to be extraordinarily voracious as German *Viel-frasz*, and English *glutton* testify.

Lack of space forbids citing more of the numerous borrowings into German which have undergone changes due to popular etymology. For the same reason words showing similar changes in other languages, especially in Latin and French, cannot be given at this time.

JOHN V. CORTELYOU.

KANSAS CITY ALUMNI REUNION.

KANSAS CITY, MO., March 24, 1905.

To Graduates and Former Students:

DEAR FRIENDS.—Saturday, April 8, 8 P. M., has been selected for the annual reunion of graduates and former students from the Kansas State Agricultural College now living in or near the two Kansas Cities. This notice is to answer the double purpose of inviting you, who read it, and of asking you to kindly invite any one else eligible like yourself, who may not be on our list.

Our meeting will be held in the Athenæum rooms, Pepper Building, corner of 9th and Locust streets, where it is our plan to have a social good time, a little music ("chin" and otherwise), and a little something for the stomach's sake—all informal. All expenses of this reunion will probably be covered by the 50 cent annual dues, the payment of which makes you a member of the association.

Please let me know soon if you will be there so I can make my report to the entertainment committee before April 1. The more the merrier—and I believe nearly everybody is going to come.

Yours truly,

T. W. MORSE, Sec'y.

1100 West 40th street.

P. S.—Please have me correct your address.

THE INDUSTRIALIST.

Published weekly during the College year by the
Printing Department of the

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD Ellsworth
HON. J. W. BERRY ['83] Jewell City
HON. J. O. TULLOSS ['99]..... Sedan
HON. A. M. STORY..... Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

The cadets began target practice last Saturday.

The Board of Regents will hold its spring meeting on April 13, 14, and 15.

Professor Walters is laying a fine cement sidewalk in front of his residence on Bluemont Avenue.

Farm work started in earnest last week. A large amount of plowing was done for spring crops and a considerable tract was seeded to grass.

The noted Shakespearian actor, John Griffith, visited College on Friday morning and addressed the students in chapel on Shakespearian plays—more particularly on Macbeth.

Profs. O. Erf, G. C. Wheeler and R. J. Kinzer shipped a car-load of sheep to Kansas City last Wednesday to be slaughtered and dressed. Dr. S. C. Orr accompanied the party to do some photographic work.

The Farm Department has made plans for a series of experiments in intensive farming, a part of which was put in operation this week. A tract of land was planted in potatoes. When these are grown, corn or sorghum will be planted between the rows.

A preliminary count indicates that the enrolment for the spring term will be greater than that of any other spring term in the history of the institution. The regular count will be made next Tuesday. It is thought that the attendance will exceed last year's record from twenty-five to thirty students.

On April 7, the city council of Manhattan will let the contract for a continuous cement curbing on both sides of Leavenworth street from the City Hall to President Nichols' residence. It is intended to pave this street during the summer, and later to extend the macadam and curbing to the College gate.

The Chemical Department is now enjoying the use of some new apparatus and specimen cases just finished by the Mechanical Department with its accustomed skill and regard for good work. The cases are of a design in which, while preserving a unity of style and manner of construction, the width and depth may be made to meet the varied conditions imposed by the wall space or the character of the material to be installed. The present cases occupy about fifty feet of wall space.

Prof. F. S. Schoenleber, D. V. S., the newly elected State Veterinarian and head of the department of veterinary science of this College, has arrived from Chicago and commenced work. The doctor is an experienced specialist and comes to us with excellent recommendations.

Professor Willard's office is to be much improved in appearance by replacing, by a series of pamphlet cases, the unsightly envelopes in which files of Experiment Station bulletins and other pamphlets are now kept. These cases are of his own design, are simple and cheap and present a very neat appearance.

The sheep that have been under experiment for the last three months were shipped Monday to Kansas City, where slaughter tests will be made and data secured for publication. Doctor Kirchenes, U. S. sheep specialist and government inspector, was here Saturday to inspect them. He complimented the Animal Husbandry Department very highly on the plan and the result of the experiment. He said that it was the best that he had ever seen.—*Students' Herald*.

A number of the dairy short-course boys who wanted positions have already secured work. Waldo Whitman goes to Dundee county, Nebraska, to run a dairy farm at a salary of \$50 per month. Mr. Desler will have charge of a creamery at Norton, Kan., at the same wages. Wilson and Jorgenson will manage a farm near Kansas City, Mo. Tom Bower goes to Stockville, Mo., and Paris Hersey to Florin, Penn., as butter makers at good salaries. Mr. Frame has received an offer of a position on a dairy farm in Alabama.—*Students' Herald*.

J. W. Troutman, a prominent stock raiser of Lyon county, having a ranch near Comiskey, spent a day or two in town and about College this week. Mr. Troutman spoke in enthusiastic terms of what he saw both of the city and College. Said he was surprised and greatly pleased at the appearance of things here and at once made up his mind to locate here with his family, who are stopping in Emporia for college and school advantages. He would like to trade his residence at Emporia for a Manhattan residence, and advertised to that effect. Who is there who will trade?—*Daily Republic*.

Foreman Elling was given an assistant this week at the Hays Experiment Station in the person of Mr. A. D. Colliver. Mr. Colliver is recommended very highly as just the man for the place. At the corn-judging contest, held recently at the College, and at which time several valuable prizes were awarded by implement companies, he took first in everything. Mr. Pelham, who will have charge of the horticultural work at the Station, also came from the Agricultural College this week. He is a specialist in this line and is said to be very competent.—*Hays City Republican*. Mr. Colliver took the final examinations at the College and will receive his diploma in June. He has left for Hays.

Last Saturday afternoon the first of a series of cross-country runs took place. The start was from Agricultural Hall and the finish at the top of Bluemont. First place was won by Ramsey, junior, time thirteen minutes and fifty seconds; second, Courter, senior; third, Stauffer, sophomore; and fourth Alspach, freshman. These races are interesting and are worth coming out to see. The next one takes place to-day, Saturday, April 1, starting from the Agricultural Hall. After winning ten points, a runner is to receive a handicap. The winner of the series is to be awarded a gold medal.

The *Alma Enterprise* says: "The first Wabaunsee county boy to ever graduate from a veterinary college finished his three years' course this week and came up from Kansas City Wednesday, and his name is now Dr. E. H. Kilian, D. V. S." The *Enterprise* is mistaken as far as the "first Wabaunsee county boy" is concerned. B. Buchli, M. S., D. V. S., now a prominent stock raiser living ten miles southwest of Alma, graduated from this College in 1884. After graduating here he studied veterinary science in several leading colleges, and completed his course in the veterinary department of Iowa Agricultural College, with the degree of D. V. S. The degree of M. S. he obtained at Manhattan in 1886.

ALUMNI AND FORMER STUDENTS.

Miss Josephine Finley, K. S. A. C. '00, goes to Kansas City this week to deliver a course of lectures on dietetics before the nurses of four of the Kansas City hospitals.—*Nationalist*.

Friends of Miss Amanda Culp, '00, will be interested to hear of her marriage to George C. Coats, which will occur at the Christian church at Mountain Grove, Mo., at 8 o'clock Wednesday evening, April 5.—*Nationalist*.

A. B. Kimball ['89], of Scandia, went through on the 16th to Manhattan. He will meet Mrs. Kimball at that place and then go to Fairland, I. T., where he will engage in the telephone business.—*Belleville Daily Freeman*.

C. C. Smith ['94] has sold the *Lincoln Republic* to D. E. McCollum who will take possession April 10. Mr. McCollum was formerly editor of the *Public Opinion*, at Osage City. C. C. has not made definite arrangements as yet, but will probably locate in Manhattan.—*Mercury*.

KANSAS STATE AGRICULTURAL COLLEGE

SIX FOUR-YEAR COURSES OF STUDY

Each leading to the degree of Bachelor of Science, are as follows:

1. Agriculture.
2. Domestic Science.
3. Mechanical Engineering.
4. Electrical Engineering.
5. Architecture.
6. General Science.

This Institution is supported by the general government and by the State of Kansas, and is designed, by its instruction, to promote the liberal and practical education of the industrial classes in the several pursuits of life.

All Common-school Branches are taught each term, and nearly all the first- and second-year subjects, so that it is possible for one to get nearly all subjects of the first two years by attendance during winter terms only.

THREE SHORT COURSES

Open to students of mature age who cannot, for lack of time or money, take one of the four-year courses.

1. Domestic Science, two fall terms of twelve weeks each.
2. Dairying, one winter term of twelve weeks.
3. Agriculture, two winter terms of twelve weeks each.

College Classes are open to both sexes. Tuition is free. An incidental fee of \$3 per term is charged all students from Kansas. There is no charge for laboratory supplies. Room and board can be had at very reasonable rates. The yearly expenses, exclusive of clothing and traveling, are between \$100 and \$200. All College laboratories, shops and classrooms are well supplied with needful apparatus and appliances. A preparatory department is maintained for persons over eighteen who cannot pass the common-school branches.

For catalogue or other information, address

Pres. E. R. Nichols, - - - Manhattan, Kan.

Historical Society

VOL. 31

NO. 28

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894. L

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg)...	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoemith, B. S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss C. Jeanette Perry, B. S. (K. S. A. C.).....	Executive Clerk
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., APRIL 8, 1905.

No. 28

ADDITIONS TO THE LIST OF KANSAS SPIDERS.

IN his Preliminary List of Kansas Spiders, published in Vol. 30, No. 24, of THE INDUSTRIALIST, the writer recorded one hundred species taken within the borders of the State and expressed the desire to double the list during the collecting season of 1904. Alack, the frequency of expectations unfulfilled! But forty-three additional species have been taken up to date, most of these, however, on ground already covered in the season of 1903. A few days were spent in collecting along the Rock Island in the southwestern part of the State, and at Lawrence—territory not visited the previous year. A large group of very small spiders, *Erigoneae*, has as yet no representatives in the College collection.

Four species new to science are described and figured in this paper. Several other single specimens probably represent new species, but it is not the policy of the writer to describe from a single specimen. To merit description a supposedly new type should be fairly well represented in some locality.

The forty-three species herein listed represent eleven families and twenty-nine genera. Three of the families and seventeen of the genera were not included in the first list. All summed up, then, we have recorded from Kansas one hundred forty-three species of spiders, representing sixteen families and sixty-seven genera.

The plate illustrations in this paper are from the pen of Miss Ella Weeks.

Types of the new species are in the College collection and in the National Museum at Washington.

Family ATYPIDÆ.

Brachybothrum robustum, Simon.

Brachybothrum, robustum, Simon. Actes Soc. Linn. Bord., Vol. 44, p. 7.

Two males from Manhattan, April 5, and an immature female from Delphos, August 5.

Family ULOBORIDÆ.

Uloborus plumipes, Lucas.

Uloborus plumipes, Lucas. Explor.d'Algerie Anim., Art. I, p. 252.

Two females taken in webs with cocoons at Manhattan, July 14.
Immature male from St. George, June 6.

Hyptiotes cavatus, Hentz.

Cyllopodia cavata, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 466.

The triangle spider is apparently rare in Kansas. A single specimen was found at Three-Mile Hill, near Manhattan, October 10.

Family THOMISIDÆ.

Xysticus texanus, Banks.

Xysticus texanus, Banks. Journ. N. Y. Ent. Soc., XII, 1904, p. 112.

Two females of this prettily marked spider in a collection made at Delphos, August 5.

Xysticus graminis, Emerton.

Xysticus graminis, Emerton. Trans. Con. Acad., VIII, 1892, p. 364.

A male of this species from Manhattan, May 5.

Ebo latithorax, Keyserling.

Ebo latithorax, Keyserling. Neue Spinn. aus Amer., V, 1883, p. 678.

Adults of this species have not been observed, but the young were taken in considerable numbers in sweeping at Manhattan, October 11.

Philodromus rufus, Walckenaer.

Philodromus rufus, Walckenaer. Ins. Apt., I, 1837-47, p. 555.

Several specimens collected at Minneapolis, June 30.

Philodromoides, gen. nov.

Cephalothorax low, about as wide as long; head region much narrowed and slightly elevated. Abdomen fully twice as long as wide, very little wider behind than at the base; somewhat pointed at the end; the base projects a short distance over the cephalothorax, and is distinctly notched on the upper side. The sternum and labium are about as in *Philodromus*. All eyes approximately equal in size; the anterior row much the shorter and slightly recurved; median eyes of this row farther from each other than from the side eyes. Posterior row also recurved; side eyes of this row on larger tubercles than any of the others; median eyes farther from each other than from the side eyes. Ocular quadrangle considerably wider behind; about as wide as long. Clypeus wider than space between anterior median eyes, but not as wide as space between posterior median eyes; obliquely directed forward and downward. Legs long and slender, the second pair longest, the third shortest; the relative lengths are, in their order, second pair, first pair, fourth pair, third pair. The tibiæ of the first and second pairs are set beneath with ten or twelve stout spines arranged in

two rows, and the metatarsi are similarly armed with half that number. Weaker spines likewise occur on the other two pairs of legs and on the pedipalps.

Philodromoides prataria, sp. nov. (fig. 10).

Female.—Length, 6 mm.; length and width of cephalothorax, 2 mm.; width of abdomen, 2 mm. Other characters as given in the generic description. A very few short bristle-like hairs scattered about among the spines on the outer joints of the legs and on the chelicerae and the pedipalps; thickest on the tarsi of the latter.

Coloration.—Abdomen plain brown above, mottled and streaked with a lighter shade. The four muscle impressions are quite distinct. Cephalothorax rusty-brown, lighter at the sides and just back of the head region. Streaks marked by depressed lines radiate from the dorsal groove. The sternum is pale yellow or almost white. The abdomen is lighter beneath than above, and there is a less mottled central region, set off by a row of indistinct dots on either side. The legs are pale yellow to whitish. The femora, patellæ and tibiæ of all four pairs are marked in front with a longitudinal stripe of black, which becomes neatly obliterated on the metatarsi and tarsi. The corresponding joints of the legs of the third and fourth pairs are similarly marked on the hind border also. The males are somewhat smaller than the females, the abdomen being considerably narrower than the cephalothorax. The legs are more hairy in appearance and the spines less conspicuous than in the female. The color markings are about the same in the two sexes. This species is not uncommon about Manhattan, Kansas, in mid-summer. Mature males and females were taken in this locality on August 17.

Family CLUBIONIDÆ.

Castaneira crocata, Hentz.

Herpyllus crocatus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 457.

Representatives of this species from Wallace, August 20, and from Manhattan, July 29. From its general appearance and movements this spider might, at first sight, be easily mistaken for a velvet ant (Mutillid).

Trachelas tranquilla, Hentz.

Clubiona tranquilla, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 450.

One female taken in collecting under stones at Lawrence, October 8.

Family DRASSIDÆ.

Zelotes decepta, Banks.

Prothesima decepta, Banks. Proc. Acad. Nat. Sci. Philad., 1900, p. 531.

A single male specimen from Manhattan, May 5.

Zelotes rufula, Banks.

Prothesima rufula, Banks. Proc. Acad. Nat. Sci. Philad., 1892, p. 17.

A single female specimen from Manhattan, May 5.

Melanophora atra, Hentz.

Herpyllus ater, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 455.

Two females from Manhattan, May 1.

Gnaphosa sericata, Koch.

Herpyllus bicolor, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 456.

One female from Manhattan, July 27.

Family SALTICIDÆ.

Phidippus pius, sp. nov. (figs. 1, 2, 7).

A medium sized species rather light in color. One male taken at Manhattan in October and two females in July.

Measurements.—Length of female 9-10 mm. Length of abdomen 5mm.; width of abdomen 3mm. Width of cephalothorax about the same as that of abdomen. The measurements of the male are very approximately the same, except that the abdomen is slightly narrower.

Legs.—Relative length, female, 4, 1, 2, 3; male, 1, 4, 2, 3. The legs of the first pair are considerably stouter than any of the others. First and second metatarsi set beneath with six stout spines in two rows. Tarsi of same legs with four spines. A few spines, less regularly placed, on the other legs also.

Colors.—Female pale yellow beneath without markings. Very much the same above except for a dark area occupying the ocular quadrangle and two narrow dark colored streaks, one on either side of the median line of the abdomen. The latter are not at all distinct on the anterior third of the abdomen. Two or more pairs of white spots dot these dark streaks. The ground color of the male is somewhat darker, shading into orange brown on the cephalothorax and legs. Like the female, the male is unmarked beneath and has above the two dark streaks on the abdomen and the dark area on the ocular quadrangle. The femora and, to a certain extent, the other joints of all the legs are more or less streaked or almost banded with very dark brown. The tips of the tarsi in both sexes are dark. Palpal organs of the male dark except at the tip. Other joints of the palps pale and unmarked.

The body and legs of both sexes are sparsely covered with long silky hairs, with here and there a spine.

Phidippus texanus, Banks.

Phidippus texanus, Banks. Proc. Ent. Soc. Wash., 1905.

Not uncommon in the late summer and the autumn months. Specimens taken at Englewood and Medora in July, and at Manhattan in October.

Phidippus multiformis, Emerton.

Phidippus multiformis, Emerton. Trans. Conn. Acad., VIII. 1891, p. 6.

Two females and one male from Manhattan, July 27.

Phidippus montivagus, Peckham.

Phidippus montivagus, Peckham. Trans. Wisconsin Acad., XIII, p. 293.

A single specimen, female, from Manhattan, July 14.

Dendryphantes glacialis, sp. nov. (figs. 3, 4, 8).

An average sized species, conspicuously striped on the abdomen. Two females were taken at Manhattan, May 26, and a pair in the glacial region near St. George, June 6.

Measurements.—Female 5.5mm., male 5mm. in length. Cephalothorax 2.5mm. long, 2 mm. wide.

Colors.—The cephalothorax of this species is reddish brown, with scattering white hairs thick enough at the sides and on the posterior slope to almost give the appearance of a band or stripe. About the eyes the red-brown is several shades darker. The ground color of the abdomen is dirty white tinged with yellow. Down the median line is a brown stripe, a little the wider in the male. On either side of this stripe is another of the same color and approximate width, curving a little to conform to the lateral border of the abdomen. Still another and wider stripe, not visible from a dorsal view, runs along each side of the abdomen. In the female this stripe is broken into spots or streaks. On the ventral surface there is a narrow median stripe from the genital opening to the spinnerets, and a wider stripe each side of this.

The legs and palps are dull yellow tinged with brown, unmarked in the female, but much darker with some appearance of banding in the male.

The front row of eyes is curved, with the middle eyes fully twice as large as the lateral and almost as widely separated as the former and latter.

Dendryphantes militaris, Hentz.

Attus militaris, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 201.

Not so common as *D. capitatus*. Specimens taken at Manhattan in October.

Pellenes cognatus, Peckham.

Pellenes cognatus, Peckham. Bull. Wis. Nat. Hist. Soc., I, 1901, p. 224.

One specimen, a female, from Arkalon, July 21.

Peckhamia picata, Hentz.

Synemosyna picata, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 370.

A pair of these ant-like spiders taken at Manhattan, October 10.
Neither sex was quite mature.

Maevia vittata, Hentz.

Attus vittatus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 360.

Fairly common. Mature specimens taken at St. George, June 6, and at Manhattan in October.

Thiodina sylvana, Hentz.

Attus sylvanus, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 364.

A male of this species from St. George, June 6.

Wala palmarum, Hentz.

Epiblemum palmarum, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 366.

Three males in material collected at Lawrence, October 8.

Family ARGIOPIDÆ.

Araneus aculeatus, Emerton.

Epeira aculeata, Emerton. Bull. U. S. Geol. Surv. Terr., III, 1877, p. 528.

One specimen, a female, from Clark county, June 15.

Araneus trifolium, Hentz.

Epeira trifolium, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 471.

This large orb-weaver is represented in the College collection by a single specimen, female, taken at Manhattan, August 22.

Araneus displicatus, Hentz.

Epeira displicata, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 476.

One male from St. George, June 6.

Araneus mormon, Keyserling.

Epeira mormon, Keyserling. Die Spinnen Amer., Volume IV.

A few specimens taken in provision stores of mud-dauber wasps at Meade, July 18.

Acacesia foliata, Hentz.

Epeira foliata, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 475.

One female taken in sweeping at Lawrence, September 8.

Mangora placida, Hentz.

Epeira placida, Hentz. Jour. Bost. Soc. Nat. Hist., V, 1845, p. 475.

One female from Manhattan, May 2. Several males, lacking one moult of maturity, collected at Lawrence, October 10.

Singa nigripes, Keyserling.

Singa nigripes, Keyserling. Verh. d. z. b. Ges. Wien, 1883, p. 655.

The species is fairly common in some localities. Specimens from St. George, June 6.

Family LYCOSIDÆ.

***Lycosa gracilis*, Banks.**

Lycosa gracilis, Banks. Proc. Acad. Nat. Sci. Philad., 1892, p. 70.

A male from Manhattan, May 20.

***Lycosa punctulata*, Hentz.**

Lycosa punctulata, Hentz. Jour. Bost. Soc. Nat. Hist., IV, 1842, p. 390.

A mature female of this moderately large species from Manhattan, October 6.

***Lycosa rufiventris*, Banks.**

Lycosa rufiventris, Banks. Proc. Acad. Nat. Sci. Philad., 1892, p. 65.

Not uncommon. Specimens taken at Manhattan in October and April.

***Lycosa permiana*, sp. nov. (figs. 5, 6, 9).**

A medium sized spider not uncommon in the spring and early summer. It hides among stones at some distance from water courses.

Measurements.—Female about 15mm. in length; male 10-11mm. Cephalothorax of female 6mm. long, 4.5mm. wide; moderately arched, the highest point being about midway between the posterior eyes and the front of the dark line marking the dorsal groove. First leg 14mm.; fourth leg 18mm.

Colors (in alcohol).—The ground color of both sexes is light yellow. In the male the abdomen is streaked and spotted with black above and brown below. In the female the similar markings of the abdomen are brown both on the dorsal and the ventral surfaces. The ground color of the abdomen in this sex is sometimes more nearly dirty white than yellow. The markings of the cephalothorax are alike in the two sexes—a rich brown on the sides of the head and in the region traversed by the depressed lines radiating from the dorsal groove. The top of the head, or highest portion of the cephalothorax, is yellow. It is marked posteriorly by a pair of brown spots. A dark line marks the dorsal groove. The legs are light yellow, unmarked but tinged with a suggestion of brown in places, especially on the distal joints. Numerous long dark spines and a sparse covering of dark hairs tend to obscure the ground color of the legs. The coxæ and the sternum are brownish. The tarsi of the male palps are dark brown.

Lycosids of this species collected at Manhattan in April and at Delphos in May. Both sexes mature at this time.



Fig. 1

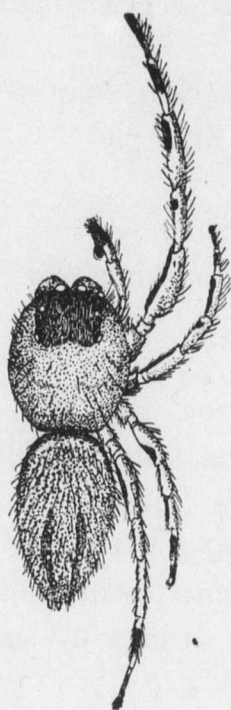


Fig. 2



Fig. 3



Fig. 4

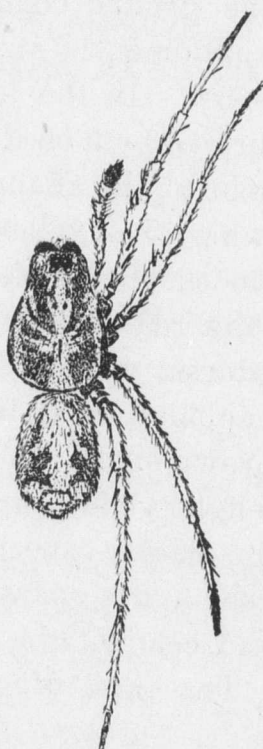


Fig. 5

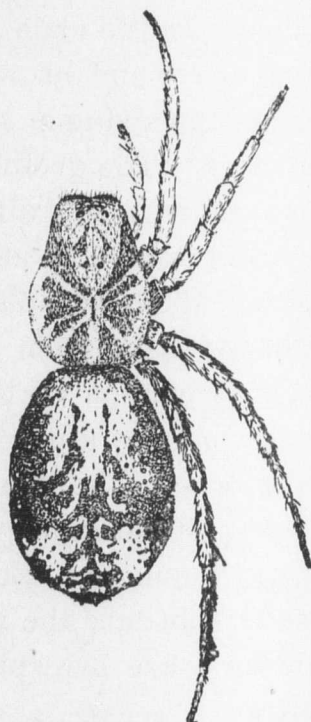


Fig. 6



Fig. 7

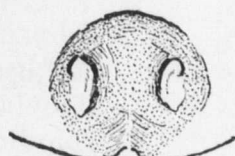


Fig. 8

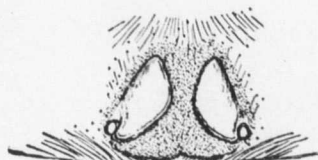


Fig. 9

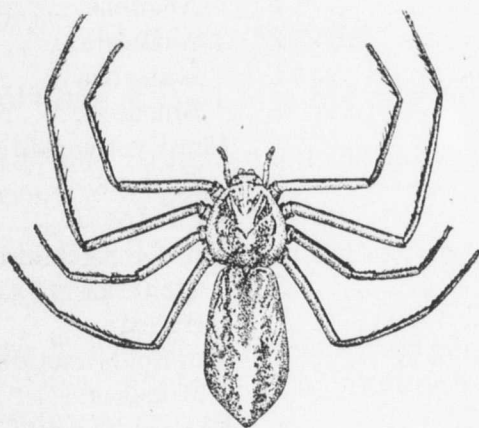


Fig. 10

Pardosa texana, Banks.

Pardosa, texana, Banks. Jour. N. Y. Ent. Soc., XII, 1904, p. 115.

One specimen, a female, from Englewood, August 8.

Pardosa milvina, Hentz.

Lycosa milvina, Hentz. Jour. Bost. Soc. Nat. Hist., IV, 1842, p. 392.

One Lycosid of this species from Meade, July 18.

Family AGELENIDÆ.

Cicurina arcuata, Keyserling.

Cicurina arcuata, Keyserling. Verh. d. z. b. Ges. Wien, 1887, p. 460.

Two specimens, a male and a female, taken at Manhattan, May 5.

Hahnina agilis, Keyserling.

Hahnina agilis, Keyserling. Verh. d. z. b. Ges. Wien, 1887, p. 465.

One specimen from Manhattan, April 15.

Family MIMETIDÆ.

Mimetus interfector, Hentz.

Mimetus interfector, Hentz. Jour. Bost. Soc. Nat. Hist., VI, 1850, p. 32.

A female of this species taken in sweeping at Minneapolis, June 30.

Family THERIDIIDÆ.

Theridion puncto-sparsum, Emerton.

Theridion puncto-sparsum, Emerton. Trans. Conn. Acad., VI, 1882, p. 12.

Found occasionally at Manhattan. Specimens taken in July.

Theridion differens, Emerton.

Theridion differens, Emerton. Trans. Conn. Acad., VI, 1882, p. 9.

One specimen from Manhattan, May 26.

SUMMARY OF GENERA AND SPECIES

Family Atypidæ.		Pellenes.....	1
Brachybothrum.....	1	Peckhamia.....	1
Family Uloboridæ.		Maevia.....	1
Uloborus.....	1	Thiodina.....	1
Hyptiotes.....	1	Wala.....	1
Family Thomisidæ.		Family Argiopidæ.	
Xysticus.....	2	Araneus.....	4
Ebo.....	1	Acacesia.....	1
Philodromus.....	1	Mangora.....	1
Philodromoides.....	1	Singa.....	1
Family Clubionidæ.		Family Lycosidæ.	
Castaneira.....	1	Lycosa.....	4
Trachelas.....	1	Pardosa.....	2
Family Drassidæ.		Family Agelenidæ.	
Zelotes.....	2	Cicurina.....	1
Melanophora.....	1	Hahnia.....	1
Gnaphosa.....	1	Family Mimetidæ.	
Family Salticidæ.		Mimetus.....	1
Phidippus.....	4	Family Theridiidæ.	
Dendryphantes.....	2	Theridion.....	2

EXPLANATION OF PLATE.

- Fig. 1. *Phidippus pius*, female x 4.
 Fig. 2. *Phidippus pius*, male x 4.
 Fig. 3. *Dendryphantes glacialis*, male x 7.
 Fig. 4. *Dendryphantes glacialis*, female x 7.
 Fig. 5. *Lycosa permiana*, male x 3.
 Fig. 6. *Lycosa permiana*, female x 3.
 Fig. 7. Epigynum of *Phidippus pius*.
 Fig. 8. Epigynum of *Dendryphantes glacialis*.
 Fig. 9. Epigynum of *Lycosa permiana*.
 Fig. 10. *Philodromoides pratensis*, female x 5.

THEO. H. SCHEFFER.

The Department of Biology has done a large amount of work this spring in preparing and mailing gopher and prairie-dog poison. Professor Popenoe reports that some days the sales amounted to several hundred cans. Many of the western counties have taken advantage of the State law giving township officers the right to buy poison of the State laboratory, from the funds of their township. Trustee Ely Barger, of Carmen, Gray county, bought \$105 worth for his township. Trustee E. T. Lewis, of Jerome, Gove county, bought \$630 worth in one bill and \$175 worth in another. Formerly the requests for the prairie-dog preparation were more numerous than those for the gopher poison, but at present the latter is required in larger quantities.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. S. McDOWELL, President, Smith Center
HON. C. E. FRIEND ['88], Vice-Pres.... Soldier
HON. E. T. FAIRCHILD.....Ellsworth
HON. J. W. BERRY ['83].....Jewell City
HON. J. O. TULLOSS ['99].....Sedan
HON. A. M. STORY.....Manhattan
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

President Nichols has moved into his new house.

Assistants Halsted and Scheffer will be instructors in the normal institute of Riley county in June.

The Architectural club held an enthusiastic meeting in the city library building last Saturday night.

Miss Marguerite E. Barbour, director of physical training, entertained her calisthenics class at a luncheon at the Manhattan Candy Kitchen, Friday evening.

Doctor Schoenleber has moved into the house formerly occupied by Mr. Barnhouse. Mr. Barnhouse has moved into the former Nichols' residence.

The experiment station issued this week press bulletin No. 137, entitled "Some Troubles of Swine," and prepared by Assistant Professor C. L. Barnes, of the Veterinary Department.

The first years have elected the following officers for the spring term: President, B. H. Wilbur; vice-president, Stella Hawkins; secretary, Beulah Pittman; treasurer, Kittell; marshal, Worswick.

An examination of teachers who wish to teach in the Manhattan city schools next year will be held Saturday, May 13. The only certificates regularly accepted by the board are life diplomas and State certificates.

The Horticultural Department has constructed a driveway to the Auditorium, on the west, side and has seeded the lawns and embankments about the building to blue-grass. By Commencement the campus will be as fair as ever.

Chas. Hughes, private secretary to President Nichols, has resigned his position and will go to Kansas City about May 1, to study law in the Kansas City Law School. Mr. Hughes has been an efficient, trustworthy and gentlemanly clerk, and we have no doubt concerning his future.

Capt. I. C. Weatherford, of the southwestern branch of the Salvation Army, with headquarters at 13th and Walnut streets, Kansas City, Mo., spoke to the students from the chapel rostrum on Thursday morning. He was here to solicit financial aid for the benefit of the Army.

Chicago 13, Kansas State Agricultural College 0, was the result of the baseball game Thursday afternoon at Athletic Park; but notwithstanding this defeat of our boys by a professional team of very high skill, our boys did well. The attendance must have reached a thousand or more. Baseball enthusiasts, young and old, had come for miles to see the game.

The enrolment for spring term last Tuesday was 876. Of these there were 8 graduates, 25 special students, 104 seniors, 118 juniors, 155 sophomores, 382 freshmen, 83 preparatory and apprentice. The attendance, although much smaller than that of the fall and winter terms, is larger than that of any spring term in the history of the institution. The Agricultural College draws its students chiefly from rural districts, which accounts for the greatly reduced attendance after March 25.

Professor Kammeyer and Miss Rice went to Chapman, Kan., last Saturday to serve as judges on delivery at the annual inter-society oratorical contest of the Dickinson County High School. They were entertained while there at the home of Miss Edith Goodwin, B. S., '03, who is one of the high-school teachers. Miss Goodwin is an enthusiastic representative of her Alma Mater, and never misses an opportunity to say a good word for K. S. A. C. Miss Rice and Professor Kammeyer report a good program and a fine time.

ALUMNI AND FORMER STUDENTS.

Major Albert Todd, '72, of the United States Artillery Corps, has been transferred from Governor's Island to Minneapolis, Minn.

Mary Davis, '04, is now post-office clerk in the Secretary's office taking the place made by the promotion of Miss Huntress.

Edith Huntress, '01, has succeeded Miss Perry in the Secretary's office, having served an apprenticeship in a less responsible capacity.

M. E. Joslin, junior in 1899, visited his sisters, who are attending College, and also looked about the institution at the beginning of this term.

R. E. Lofinck, '75, a well-known and prosperous merchant of Manhattan, was married Wednesday, March 22, to Miss Ida Barr, at the home of the bride's parents, in Chicago.

Alice (Perry) Hill, '03, will soon join her husband at Fayette, Mo., where Mr. Hill has engaged in the retail lumber business. These young people will be much missed in Manhattan.

Dr. F. E. Johnson, '00, is now looking after quarantine work for the United States government. This keeps him traveling most of the time, with headquarters liable to change at any time. He visited the College this week and seemed to be standing the work well.

Miss Emma Smith, K. S. A. C. 1904, and Sherman B. Burt were married last week and have gone to housekeeping on a farm south of Wamego.—*Nationalist*.

D. W. Randall, '99, has gone to Washington, D. C., to take a year's study in laboratory and field work in the office of public road inquiry. During this time he receives a salary sufficient to meet his expenses, and will then be prepared for a more remunerative position in government service.

The many friends of Capt. Mark Wheeler ['97] and Miss Janette Carpenter [junior '97] can extend congratulations. The marriage will be the second week in May, after which they sail for the Philippines. The marriage ceremony is to be at Professor Carpenter's, Lansing, Mich.—*Nationalist*.

Jeanette Perry, '98, after several years of most efficient service as clerk in the Secretary's office, resigned the position March 31. The work and the circumstances under which it must be performed are such as to test most effectually the accuracy and the faithfulness of the clerk, and in every respect Miss Perry has achieved notable success.

Invitations are out for the marriage of Miss Jeanette Perry and Henry M. Thomas, both of the class of '98, which will take place April 12. As executive clerk Miss Perry has filled an exacting and responsible position in an unusually efficient manner and she will be very much missed. We may find some resignation to our loss, however, in the fact that the gain will be to so good a man as Mr. Thomas.

At the alumni session of the Alpha Beta society on the first instant, short addresses were made by Emma (Knostman) Huse, '80, and H. W. Jones, '88, from out of town. Professor Jones also sang two songs, accompanied on the piano by Henrietta (Willard) Calvin, '86. J. T. Willard, '83, gave some reminiscences. Josephine (Wilder) McCullough, '98, presented an excellent number of the "Gleaner" the contents of which were contributed by members of years ago. These were edited and commented upon in a most happy manner. Mrs. Calvin occupied the chair during the alumni proceedings.

Asst. G. C. Wheeler, '95, of the Animal Husbandry Department, has resigned his position to take charge of a large stock farm, two miles north of Kansas City, owned by Doctor Perkins, a noted Kansas City surgeon. The farm consists of four hundred acres, devoted to the raising of pure-bred Guernsey cattle, Coach horses, Shropshire sheep, and Poland-China hogs. Roy Dorman, '04, is also employed on this farm. Professor Wheeler had the offer of a \$1200 position with the government, but preferred the offer of Doctor Perkins. Mr. Wheeler has been with us for several years and has proved himself an intelligent, practical and trustworthy young man and an effective teacher. We predict for him a large measure of success in everything he may undertake.

KANSAS STATE AGRICULTURAL COLLEGE

SIX FOUR-YEAR COURSES OF STUDY

Each leading to the degree of Bachelor of Science, are as follows:

1. Agriculture.
2. Domestic Science.
3. Mechanical Engineering.
4. Electrical Engineering.
5. Architecture.
6. General Science.

This Institution is supported by the general government and by the State of Kansas, and is designed, by its instruction, to promote the liberal and practical education of the industrial classes in the several pursuits of life.

All Common-school Branches are taught each term, and nearly all the first- and second-year subjects, so that it is possible for one to get nearly all subjects of the first two years by attendance during winter terms only.

THREE SHORT COURSES

Open to students of mature age who cannot, for lack of time or money, take one of the four-year courses.

1. **Domestic Science**, two fall terms of twelve weeks each.
2. **Dairying**, one winter term of twelve weeks.
3. **Agriculture**, two winter terms of twelve weeks each.

College Classes are open to both sexes. Tuition is free. An incidental fee of \$3 per term is charged all students from Kansas. There is no charge for laboratory supplies. Room and board can be had at very reasonable rates. The yearly expenses, exclusive of clothing and traveling, are between \$100 and \$200. All College laboratories, shops and classrooms are well supplied with needful apparatus and appliances. A preparatory department is maintained for persons over eighteen who cannot pass the common-school branches.

For catalogue or other information, address

Pres. E. R. Nichols, - - Manhattan, Kan.

Historical Society

VOL. 31

NO. 29

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

◆ ◆ ◆

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

◆ ◆ ◆

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

◆ ◆ ◆

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.),	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHÖENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.),	Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.),	Assistant Professor of English
CLARENCE L. BARNES, D.V.M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.)...	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans. (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H.C.A. & M.A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph.B. (University of Chicago)....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., APRIL 15, 1905.

NO. 29

THE TREND OF ECONOMIC REFORM.

EVEN a casual observer of passing events can not fail to notice the rapid developments now taking place in the commercial and industrial affairs of our country. Since the early seventies two great forces have been contending for the mastery in the economic world, one tending toward centralization of wealth and its control; the other towards the separation of industries into competitive groups. The former does away with freedom of competition, the latter seeks to maintain it. The trust is the outgrowth of centralization while free competition is the condition essential for independent industries.

Opinions differ radically as to whether centralization or competition offers the better means of providing for the material wants of man. By some it is argued that when all the producers of a certain commodity are brought under one management, it lowers the cost of production and consequently the price of goods to the consumer, on the well-established principle that the price of any commodity is governed by the greatest cost of production which the existing demand for it will allow. When now the disadvantages of production have been eliminated by combination; when only the latest and best machinery is used and the highest skill employed which unlimited resources can command, production is cheapened and prices lowered. The further contention is made that competition means industrial warfare; that it produces numerous and sudden fluctuations of prices to the great disadvantage of both producer and consumer; and that it periodically leads to over-production and consequent depression. To this the so-called small producer replies, that competition is the life of trade; that the operation of supply and demand under free competition is the only safe and natural means of adjusting the production of wealth to its consumption; and, moreover, that it is the only safeguard which the general public has against monopolistic greed and rapacity.

The advantage in this contest has been largely on the side of centralization; first, because corporate power is greater than individual resistance; second, because the principles underlying large production are economically sound. This soundness, let it be noted, is not always applicable to the moral principles of the managers themselves. And there's the rub. Writers insist that moral principles do not and should not enter into the premises of political economy any more than they should into those of physics and chemistry; or, to parody a famous expression, the decalogue and the golden rule have no place in political economy. As a scientific abstraction, that is correct; but it does not enter very far into a solution of those vital problems which are ethical as well as economic in character. Sound ethics is a condition of monopolistic beneficence just as free competition is a condition of independent production. Neither condition exists perfectly. Just as long as men are selfish and prone to err, as sparks fly upward, trusts will be inimical to the best interests of society; and until free competition becomes something more than an assumed condition in an abstract science, there is little hope, unless restrictive legislation prove effective, of abolishing trusts. They are the products of modern industrial evolution and, for better or worse, are likely to remain with us.

The struggle for maintenance of at least a certain degree of free competition, and the numerous plans and measures proposed to bring about this result, is a long story, to which the Kansas legislature has recently added an interesting chapter. Of the four anti-trust laws enacted, the one establishing a state oil refinery has especially caused wide-spread interest and discussion. By some it is considered a step forward and in the right direction; by others, a leap in the dark. A large majority of our citizens are apparently well satisfied with all the anti-trust legislation of last winter, because the necessity for decided action of some sort was patent to all. Some, however, whose conservatism borders on timidity, are opposed to the oil refinery because they consider it a dangerous socialistic experiment. To their mind, socialism, communism and anarchy, like the owl, the prairie-dog, and the rattlesnake, all occupy the same quarters. Socialism they say is a menace to private property rights, to individual initiative, and to every form of industrial progress and prosperity. Conceding all this, does it follow that the trend of these Kansas reform meas-

ures is towards socialism? To answer this question fairly, the principals of socialism should be compared with the provisions, and especially the spirit of the law by which the oil refinery was established. The probable results that will follow this legislation should be contrasted with the definite promises of socialists as to what would follow were their plans adopted.

Socialists do not agree among themselves either as to the extent or plan of their reforms. They quite generally agree that all production of wealth should be under the control of the state; that all business managers and workmen should be state officials under departmental supervision; and that state initiative should supersede private initiative and competitive effort. Although they agree in these main points, they differ sometimes widely on the details of the industrial system they would establish. One group, sometimes called communists, advocates an equal per capita division of the product of industry based upon the units of labor time involved in each product. Another, recognizing that all men are *not* equal in needs, tastes, and productive capacities, holds to the tenet "production by each according to his capacity and distribution to each according to his needs." As set forth in the Chicago platform of the socialist party, "Socialism means that all those things upon which the people in common depend, shall by the people in common be owned and administered; . . . that the making of goods for profit shall come to an end," etc., etc. From the above it becomes manifest that socialism is the very antithesis of competition; that not a part but the whole of any industry should be owned and controlled by the state. On the other hand the state refinery does not contemplate to refine all the oil that comes from Kansas wells; nor does it deny to private capital the right to establish refineries. On the contrary, its purpose is to encourage that very thing. Reinforced by the maximum freight-rate law; the law preventing market discrimination, and the law declaring pipelines to be common carriers, it aims to reestablish and maintain that freedom of competition which will encourage private enterprise and ensure to producers of crude oil, and to refiners as well, a fair chance in an open market.

This is not even a mild form of socialism; and the trend of economic reform in Kansas is, at present, towards a decentralization of productive forces. The same may be said of other states, and of the federal policy as formulated by President Roosevelt.

Whether Congress and the state legislatures will succeed by means of restrictive legislation to prevent large combinations from exploiting the public instead of serving it, depends upon the fulfillment of several conditions. Certain it is that such measures already have accomplished much in this direction. As far back as 1870 several states of the middle west passed some very drastic laws designed to prevent railroads from making unjust rate discriminations against certain localities and shippers. These so-called granger laws were very effective in securing to all persons and places an equal chance in the markets; but the general public in those days considered the benefits which a railroad conferred upon the territory through which it ran so much greater than any injury it could possibly inflict, that there was a reaction in favor of the railroads. Laws were repealed or allowed to become a dead letter, because the reports, published by the railroads themselves, showed their financial condition to be pitiable in the extreme. A gullible public stood aghast at its own cruelty. The remarkable increase in mileage, however, during the very years covered by these reports, and the immediate resumption by the railroads of their former tactics, renewed the agitation against them, and resulted in the enactment of the Inter-state Commerce law by Congress in 1887. This law, defective in many ways, succeeded in only partially accomplishing its purpose. Pooling, rebates, discriminations, etc., continued, though not openly. The law as now amended and revised promises well; but its good results will be in direct proportion to its continued enforcement.

Even the most aggressive and honest officials are too often foiled in their attempts to enforce such laws. When investigation threatens, records are "fixed." "Figures don't lie, but liars sometimes figure." In one instance the books of a certain monopoly were deliberately burned on the eve of an investigation, thus destroying all evidence of its culpability. The recent investigation of the beef trust has brought out official figures that suggest "double entry" bookkeeping not wholly orthodox, to say the least.

Much has been expected of publicity as a means of holding in check the ravages of private monopoly; but so far, this means has been barren of tangible results. Railroads, for instance, publish a schedule of rates for general perusal, but, as has been proven, so far as their own adherence to it is concerned, it is simply a gratuitous contribution to statistical literature; ready-to-

swallow data for official investigators. Clerks, bookkeepers, directors, managers, and other employees of monopoly industries, *could* furnish damaging evidence if they would; but such official self-decapitation is too much to expect of them by an indifferent, and too often ungrateful public. Nothing short of a legal reward, large enough to insure a life competence, would induce such officials, or some of them, to give the evidence upon which conviction would be certain. Such a reward has not been included, as yet, in the publicity plan.

If in spite of these unfavorable conditions the restrictive measures of the federal government and of the several states can be enforced, it is probable that large combinations of capital will continue to flourish without destroying that freedom of competition which enables small industries to exist and independent enterprise to succeed.

A steadily increasing number of people, however, have abandoned all hope of civilizing trusts and managers of large industries. Nor do they believe that they can be rendered industrially and commercially innocuous by such laws and plans as above mentioned. Conceding the possibilities for good under monopoly production, they deny them under private management. In other words, the only safe monopoly is state monopoly. This is called by some socialism; by others public ownership. The two terms are not synonymous.

Considering the comparative ease with which laws designed to regulate private monopolies have been evaded, and the many obstacles of a personal character which stand in the way of their control to the equal advantage of all, it is very likely that the movement towards state ownership of at least certain classes of public utilities, will be greatly accelerated.

Public ownership already has passed the experimental stage in many of our towns and cities. Not many years ago the mere suggestion that cities could own and successfully operate their own light, water and traction facilities was considered an aggravated form of day-dreaming, if nothing worse. Now such a plan, like federal appropriations for internal improvements, has ceased to be a Shibboleth for even political parties. Locally, parties do not differ so much on the question of adoption as they do on the details of acquisition and management. The list of towns and cities which own and successfully operate their water plants is a long one; and

in many of these, light, transit and telephone facilities are included. At this writing Chicago is in the throes of a campaign for municipal acquisition and control of its street railways. A result favorable to municipal ownership will depend not so much upon party success at the polls—all parties being practically a unit on this question—as upon legal decisions now pending which relate to the life of certain charters granted by the city as far back as 1865.

In cities, therefore, there seems to be a growing conviction that legal control of light, water and transit monopolies can not be depended upon to insure adequacy of service, reasonable charges, or immunity from corrupting influences in matters of legislation. Nothing short of public ownership seems to promise any relief from these grievances. When cities have succeeded in demonstrating that the superior advantages claimed for public ownership can be continuously realized, then the adoption by states and the federal government of the same plan on a larger scale is only a matter of time. From national roads, post-office system, mints, Panama canal and irrigation ditches, to railroads, telegraph and telephone lines, and express service is not a far cry; nor will the extension of federal control to these industries be without precedent in other countries.

The question naturally arises, Can the objectionable consequences of private monopolies be overcome by state monopoly? Argument, and to some extent experience, answer that this can be done because of the elimination of profits. Private greed, large profits and a victimized public are concomitants under the present system; under public ownership prices would be governed by the cost of operation and maintenance, plus such an addition, for a time, as would cover the cost of acquisition or construction. What formerly were profits to the advantage of the few would now be savings for the use of all. The possibility of large profits is held responsible for the inordinate greed of private monopoly; it is considered a temptation too strong to overcome.

Conceding all this, there are still some objections that must be overcome. Profits are an incentive to efficiency in production just as truly as they are a temptation to industrial oppression. Would their removal from the scheme of production do away with temptation without disturbing efficiency? If not, then the promised savings under public ownership would be neutralized by the increased cost of operation due to less efficient management.

Some maintain that official honors and a patriotic desire to serve the public would be an incentive to industrial efficiency as strong as self-interest is under the present system. Cabinet officers and men in the diplomatic service of our nation, who receive comparatively small salaries, are pointed out as examples. Whether this would be true also of railroad presidents and managers of other large interests under public ownership will depend upon experiment rather than analogy.

Another objection is that the burdens of government, already great, would be enormously increased; so much, in fact, as to preclude the possibility of satisfactory service.

In spite of these and other objections there is unmistakable evidence of a tendency towards public ownership of public utilities by cities, states and even the federal government; and unless measures now in force or under consideration prove effective in crushing the evils of private monopoly, it is to be feared that it will extend even to socialism. The individual, strong in his own resources and jealous of his rights and opportunities can only hope that conservatism will mark every step that is taken towards the abolition of free competition.

J. E. KAMMEYER.

THE YOUNG WOMEN'S CHRISTIAN ASSOCIATION.

THOUGH the Young Women's Christian Association is found in some form in every country in the world, with but one exception, it is our purpose here to trace the history of the movement in our own land only, and to show something of the association work in the United States.

The association idea came first from the Young Men's Christian Association in London, then from the Ladies' Christian Union organizations in New York about fifty years ago. But the first Young Women's Christian Association, as it exists to-day, was not organized until 1873, and to the State Normal School of Illinois belongs the honor of having the first association.

College people have banded themselves together in Christian work before this time, and in coeducational schools there has existed Students' Christian Associations for several years, yet there was a feeling with both the men and women that better work could be done in independent organizations. The young men reorganized, the young women soon followed. The work now was for young women by young women.

Once started, the movement grew rapidly. In three years we find eighty associations, but these eighty soon realized that there could not be great strength in isolation, and that some union was necessary. As a result, the associations in the different states banded themselves together. Iowa was the first to take this step. Nine others quickly followed, Kansas being among the first.

At this time the girls in the cities saw the young men in the cities in their Y. M. C. A. work, the college girls with their association interests, and the question came to them, If it were profitable and a great help to the others, why should they not have such things? They answer their own question by organizing City Young Women's Christian Associations and ask for admission into state organizations. Kalamazoo, Mich., and Topeka were the first cities to take this step.

After the state organization, naturally follows the national. In 1886, delegates from the different states came together at Lake Geneva in a conference. The organization was made permanent. The evangelical basis of membership was adopted. By that is meant that the active members of the association must be members of some Protestant church. In the fall of that year a national secretary was appointed and Chicago made the headquarters of the national work.

We might gain some idea of the growth of this movement since that time by comparing the number of associations; also the number of secretaries in different years. In October, 1904, there were ninety-three city and five hundred two college associations. In 1886, we find one national secretary; in 1901, eight national, fourteen state, nine student and sixty-eight city secretaries. In 1904, twelve national, twenty-eight state, twenty-five student and eighty-nine city secretaries.

Such is the history and growth of the association; but such figures cannot represent its work truly. The field is large. It is estimated that there are seven millions in the United States, in our cities and in our schools and colleges. At seven in the morning, when the whistle blows, thousands of girls will enter the factory and the shop; at eight, thousands more the store and the office; at nine when the bell rings, there will be a constant procession as teachers and students take their places. What is the Y. W. C. A. trying to do to meet the needs of all these girls? We know of the college work with its Bible and mission-study

classes; of its homes, where every girl is welcome; of its employment bureau, and how many a girl has been enabled to stay in college because of its help, and we know of the work at the opening of the college year, when the stranger is made to feel a little less lonely and is helped in getting acquainted with college things and people.

What it means to the college girl it means to the girl in the city. To many a young woman, the rooms of the Y.W.C.A. seem her only home and the secretary is her best friend. The lunch and rest rooms are a comfort and a necessity in a large city. The gymnasium is a source of pleasure and profit for the girls, tired out in the office and the store. Educational classes are offered for those who have been compelled to give up their education. Bible classes and mission-study work is open to all women. If she is a stranger in the city and wants work, the Y. W. C. A. stands ready to find any women some kind of employment. These things are for those who cannot visit the rooms. Some live too far away and are too busy—too tired to come so far. To meet this need, visits are made at factories at the noon hour. Song services are held, stories read and a gospel message given. This noon service, when the secretary may be expected, is a bright spot in the week to many. In the associations in the factory centers, one woman as extension secretary devotes her whole time to this work.

These different phases of the work show what the purpose of the association is: the threefold development—social, physical, and spiritual. Through it all, both in the colleges and in the cities, the aim and desire is to win young women to Christ, to build them up in Him and to send them out for Him. JENNIE M. THAYER.

The registration this year at the State University of Kansas has reached 1512, which is the largest enrolment in the history of the institution, the enrolment last year having been but 1319. We congratulate our neighbors in Lawrence to this substantial growth of nearly two hundred students. While recording another growth during the present year, we may not be able to make it 193. However, we passed the 1500 mark long ago. The attendance at the Agricultural College in 1901-'02 was 1321; in 1902-'03 it was 1396; in 1903-'04 it reached 1574; and last year it was 1605, *i.e.*, last year our attendance was nearly three hundred greater than that of the university.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS..... Editor-in-Chief
PROF. J. D. WALTERS..... Local Editor
PROF. J. T. WILLARD..... Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres..... Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres..... Sedan
HON. J. S. McDOWELL..... Smith Center
HON. E. T. FAIRCHILD..... Ellsworth
HON. A. M. STORY..... Manhattan
HON. GEO. P. GRIFFITH..... Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

President Nichols is working on the annual catalogue of 1904-'05.

A fair-sized audience attended the recital of students in music, given by the Music Department in the Auditorium last evening. Every one of the twelve numbers on the program is worthy of special mention.

The Ionian Literary Society gave a special program in the old chapel last Monday night. There were many visitors present and the program was one of the best ever given by the society. The literary and musical portion was interspersed with beautiful tableaux and drills.

The following are the newly elected officers of the Agricultural Association: President, C. W. Fryhofer; vice-president, Richard Myer; recording secretary, Mr. Watkins; corresponding secretary, Harry Oman; treasurer, Mr. Walters; critic, F. W. Caldwell; marshal, I. E. Lambert; program committee, E. E. Greenough, W. L. Hull, and G. B. Thomas; fifth and sixth members of the board, Doctor Maxwell and C. A. Perry.

The Board of Regents was in session this week. The new Regents, G. P. Griffith and A. M. Story, were sworn, together with J. S. McDowell, who had been reappointed. Regent Berry was elected president and Regent Tulloss vice-president. The following standing committees were appointed: Auditing—McDowell, Story, and Griffith; building—Berry, McDowell, and Nichols; employees—Nichols, Fairchild, and McDowell; Experiment Station—Story, Griffith, and McDowell; printing—Tulloss and Griffith; library—McDowell and Tulloss; Hays Experiment Station—Griffith and Fairchild; courses of study—Fairchild, Story, and Berry.

Professor Erf is doing effective missionary work among the farmers along the Grand Island railroad. He left on April 8 for St. Joseph, Mo., to take charge of a special dairy train, provided by the Grand Island Company and equipped by the Kansas State Agricultural College. The train is stopping at all stations along the Grand Island system, where one-hour talks to all dairymen are being given. The train consists of five cars—one lecture car, three exhibit cars for exposition apparatus and dairy products, and one Pullman. This is the first time that anything of this character has been undertaken in Kansas, and the venture will undoubtedly prove highly beneficial to the dairy interests of the counties traversed.

Professor Cortelyou's recent article in the *INDUSTRIALIST*, on the subject "Popular Etymology," is interesting and instructive and should be put on file for reference by every one receiving a copy.—*Students' Herald*.

The Engineering Association met in regular session in the electrical lecture-room on Monday evening, April 11. The feature of this meeting was an experiment with an interesting method of measuring electric waves by means of Plücker tubes.

We are glad to report increasing interest among the students concerning field athletics. The second cross-country run came off Saturday afternoon, April 1. There were ten runners in the race. The course lay from Agricultural Hall to the Zuke's Bush, one-half mile north of the College, thence to Bluemont, and from there back to the starting point, making a run of about three miles. Courter, senior, was first man, with time of 21 minutes 23 seconds; Ramsey, junior, second, time 21 minutes 48 seconds; Hastings, sophomore, third, time 22 minutes 18 seconds; Travelute, fourth, time 23 minutes 5 seconds. In the third race, which was held last Saturday, Courter covered the four-mile course in 29 minutes 10 seconds. Stauffer was second, in 30 minutes and 50 seconds, and Ramsey was third, and only ten seconds behind Stauffer. Hemphill, who was fourth, made the run in thirty-two minutes. Those who entered were: Seniors, Courter and Peairs; juniors, Ramsey and Gilliford; sophomores, Stauffer; freshmen, Hemphill and Heindrick. The next run will be of about the same length as the last and will begin with two laps around the race-track at the city park, once around the College campus, and finish with a mile on the track.

William A. McKeever, professor of psychology at the Kansas State Agricultural College, is making a special study of the smoking habit among boys and young men, and has gathered much interesting data on the subject. He is just now especially interested in the questions: (1) What actual deterioration in scholarship does the student who is an habitual smoker suffer? (2) What, if any, permanent cure is there for this habit? Professor McKeever says that many young habitual smokers, especially cigarette fiends, come to him in a distressed state of mind appealing for help. He does not believe that the average youth who is thoroughly addicted to the smoking habit can succeed in breaking up the practice without some strong outside assistance. He has found some interesting cases wherein the habit has been abruptly and permanently discontinued for the sake of the love of some young woman. In fact, religious conversion and falling in love are the two leading antidotes thus far recorded for this baseful practice among youths. Professor McKeever is anxious to have all those who may have interesting data write him in answer to the two questions above. Actual observations or experience are wanted, not mere opinions. A brief history of each case should be included in the report. Whenever desired, the correspondence will be considered as strictly confidential.—*Daily Republic*.

The Experiment Station is mailing this week Bulletin No. 126, on "Experiments with Hand-Fed Calves." The bulletin is a neat little booklet of thirty-six pages, illustrated with several half-tones of College cattle. It was prepared by the Animal Husbandry Department and is credited to D. H. Otis, the former professor, and to a number of special students.

The Experiment Station this week has mailed Press Bulletin No. 138, containing a timely article on "Testing Seed-Corn for Vitality," prepared by Ass't. V. M. Shoesmith, of the Farm Department. The article contains a table showing that the average per cent of seeds germinated in a large number of samples is 82 in shock corn, 92.2 in crib corn, 99 in well-stored seed-corn, or 91.8 in 58 samples tested.

A HALF CENTURY IN THE SCHOOLROOM.

Our colleague and friend, Principal Benjamin S. McFarland, having, on April 8, 1905, completed fifty years of service as a teacher, we, the Faculty of the Kansas State Agricultural College, esteem it a privilege to extend to him our hearty felicitations. His rare devotion to the great work of public education merits attention, not only because of its duration but especially because of its high quality.

An efficient instructor and administrator, a vigorous but kind disciplinarian, a wise counselor, a dignified and courteous gentleman, a faithful friend and a genial comrade, Professor McFarland holds the esteem and affections of us all. We rejoice that the Agricultural College commands his services as principal of its Preparatory Department, and venture to hope that for many years to come he may continue in health and prosperity to administer the affairs of that important office. To generations of students yet to be, as well as to generations that have been, may his name be fragrant and his memory green.

We request the Secretary to spread these words of appreciation upon the Faculty records and also to transmit a copy to Professor McFarland.

In behalf of the Faculty: { E. R. NICHOLS,
BENJ. L. REMICK,
CLARK MILLS BRINK.

ALUMNI AND FORMER STUDENTS.

Josephine Finley, '00, is giving lectures for a month in Kansas City to the nurses in the hospitals of that city.

Mrs. C. N. Allison, of Kansas City, is the guest of her parents, Mr. and Mrs. J. C. Eggen. Mr. Allison ['01] will graduate in dentistry at Kansas City this spring and expects to settle at Falls City, Neb.—*Nationalist*.

Judge Kimble received a telegram Monday from his son, Kenneth Kimble [student in '00] stating that he would go from Richmond, Va., to Portland, Ore., this week, where he will have charge of the United States coast defence exhibit at the Lewis & Clark exposition.—*Nationalist*.

A. B. Kimball, '89, has leased the *Scandia Journal* to E. W. Kimball, '02, and moved to Fairland, I. T., where he will operate a telephone exchange.

P. M. Biddison and J. T. Skinner, of the class of '04, and G. W. Skow, junior in 1903, are employed by the Leiter Coal Company, of Zeigler, Ill., and, being uninjured by the recent explosion there, gave valuable assistance in caring for the wounded.

S. I. Wilkin, third-year student in 1892, and in the short course last term, writes a prosperity letter to Professor Dickens. He attributes his success in farming to training received at the College, and recommends making the "youngsters work hard."

Miss Nettie Wayland, senior last year, is in charge of the lunch room of the McKinley High School, of St. Louis, Mo., and the latest number of the *Herald* contains a very interesting account by her of the system employed in that city where provision has been made in the various schools for serving warm lunches to the pupils at a price designed merely to meet the cost. Miss Wayland finds her training here of the greatest value to her in this work.

In the *Students' Herald* O. B. Whipple, '04, has an interesting letter concerning his experiences at the Massachusetts Agricultural College, where he is taking graduate studies this year. He says "I grow more proud each day that I am a graduate of K. S. A. C. I think a B. S. from K. S. A. C. stands for as much hard work as such a degree from any college of its kind, not to mention other colleges; something that you are proud of after you get through."

Murray S. Cole, '02, has been working on the new Salt Lake railroad which in a few weeks will shorten by several hundred miles the route from Los Angeles to Chicago. He hopes to visit the College next Commencement and renew old acquaintances at the triennial reunion. He sends his best wishes to "the finest institution in the world." He also sends us an article concerning Mr. Hatfield, who claims to be a rain-maker and the cause of the recent unprecedented precipitation in the vicinity of Los Angeles.

The daily papers contain the following dispatch: Professor and Mrs. Alexander Graham Bell have issued invitations to the wedding reception of their daughter, Miriam Graham Bell, and Prof. David G. Fairchild ['88,] of Manhattan, Kan., on Tuesday afternoon, April 25, at 4 o'clock, at Twin Oaks, the country home of the family. The ceremony, which will take place at 3:30, will be attended only by the immediate relatives of the two young people and some few close personal friends. The bride will have no attendant, but Prof. Charles L. Marlatt ['85], of Manhattan, will act as best man for Mr. Fairchild. Mr. Fairchild and his bride will make a short out-of-town trip after their marriage, but expect to pass the spring in Washington, dividing their time between Twin Oaks and the home of the bride's parents on Connecticut avenue. On July 1 they will go abroad for a stay of several months.

F. C. Sears, '92, professor of horticulture in the Nova Scotia Agricultural College, writes of temperatures thirty-seven degrees below zero and snow ten feet deep on the level. "The latter was on the coast, however, where they do not get much snow."

Mrs. J. B. S. Norton [Gertrude Havens, '96], who returned from Denver recently, is still very poorly with lung trouble. Professor Norton ['96] is here and has sent to College Park, Md., for his goods. When they come the family will live in the Smith house, at the corner of Fourth and Vattier.—*Nationalist*.

"Wednesday evening, March 12, Miss C. Jeanette Perry was united in marriage to Mr. Henry M. Thomas, the ceremony being performed by Rev. A. W. Atkinson, of the Baptist church. The home of the bride, which was the scene of the wedding, was tastefully decorated for the occasion. About fifty invited guests and relatives of the bride and groom were present, and as soon as they had gathered, Mr. Elmer Hill, of Topeka, accompanied by Miss Lora Perry, sang 'All for You.' As the last notes died away the strains of 'Twas a Lover and his Lassie', greeted the appearance of the bride and groom, who were unattended. The simple but beautiful ring ceremony was then performed and soon the happy couple were receiving the congratulations of their friends. A dainty three course luncheon was served as the guests seated themselves for an hour's pleasant conversation. The bride's dress was of white chiffon, trimmed in Valenciennes insertion and tucks in Grecian design. She carried a large bunch of bride's roses. Mr. and Mrs. Thomas are both graduates of the Kansas State Agricultural College of the class of '98. Mrs. Thomas is well known in town circles. Since her graduation she has been connected with the College, for the greater part of the time as executive clerk in the College post-office. This position gave her an opportunity to meet practically the whole student body as well as the Faculty. By cheerful and pleasant manner Mrs. Thomas has gained the friendship of all, and her absence will be greatly felt. As a member of the Baptist church and Sunday-school, and as leader of the choir she has been a model of faithfulness. She leaves a vacancy here which will be hard to fill."—*Republic*. Mr. Thomas is collector for the J. I. Case Threshing Machine Company and his capacity in this work has received such recognition by the company that he has been placed in general charge of ten or twelve states in the East. His headquarters will be at Harrisburg, Pa. Mr. and Mrs. Thomas left Manhattan on the noon train Thursday and will visit in Osage county and in Emporia and Wichita before proceeding to their new home. Mrs. Thomas will be much missed at the College, and the best wishes of hosts of friends of both bride and groom accompany them. Within the week preceding the wedding there were several functions in honor of Miss Perry. On Friday afternoon Mrs. A. W. Atkinson and Mrs. B. F. Eyer entertained at the home of the former, the occasion being a linen shower. Those present were members of the Baptist church and Sunday-school. On Monday evening Miss Katherine Winter entertained informally at her home on Bluemont Avenue.

Historical Society

VOL. 31

NO. 30

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894. . .

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.),	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg)...	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.),	Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.),	Assistant Professor of English
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School)	Assistant in Drawing
Vernon M. Shoemith, B. S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger.....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., APRIL 22, 1905.

NO. 30

THE DEVELOPMENT OF CONSCIOUSNESS.

ABOUT the most helpless thing in the whole animal kingdom is the human infant, while the creature which possesses above all others the greatest self-control and the greatest mastery over his environment is the fully matured man. What a miracle that one of these should finally develop into the other! And yet, strange to say, there are in the world many who keep calling loudly for an outward "sign" of man's divine nature.

There is every reason to believe that every human being begins his earthly career absolutely without knowledge. Innate ideas are now considered out of the question. The child at birth seems merely to have a nervous mechanism already primed and strung up for use. Upon this the environment begins at once to act, while the reactions from within are immediately forthcoming; and thus the little being is fairly launched upon his voyage of discovery of the world.

FORMS OF INFANT ACTIVITY.—There are three modes of activity, or reaction, possible to the new-born infant, viz., reflex, instinctive, and impulsive, and in the last named lies his promise of intellectual reward. The reflex acts are such as afford immediate protection of some part of the body that is threatened with injury. Withdrawing the hand or foot when it is touched or pricked, and winking the eyes to avoid outside contact with the sensitive parts, are examples. These acts go on as well at first as they ever do, and the child seems to learn nothing from them, as they are more or less unconscious. Nursing is the best example of the child's instinctive activity. Again, the instinctive act is so definite in its progress that there is necessarily little consciousness attending.

IMPULSIVE ACTION PECULIAR.—But it is impulsive action, the kind manifested by the child's kicking and striking indefinitely into the air, that seems to mean most for the growth of consciousness. The impulse is, strictly speaking, a sort of reaction. A simple illustration would be this: Nature somehow causes the in-

fant's little body to fill up with nervous energy, which must have a means of escape. The freest channel of overflow for this energy is usually in form of kicking and squirming, but in the process of these movements there occur all sorts of variations, some of which result in contacts and entanglements with the bed-covers and other objects in the immediate environment.

Now, every one of these contacts and interferences with the impulsive activities has its peculiar quality of feeling and adds its mite to the growing complexity of consciousness. While these acts are going on in process of training his sense of touch, the other senses are being played upon in various manners. Images of moving objects are crossing his retinas and sound vibrations are coming in over the auditory tracts. A flash of bright light or an unusually loud sound will likely give his nerves such a shock as to cause the child to break into a cry. This crying itself involves a large complex of impulsive activities both within and without. Consequently, the blood goes to certain parts of the body in fuller supply while the accompanying contortions and writhings set up a whole set of new feelings.

ALTERNATING QUIET AND UNREST.—Thus consciousness becomes enriched and, the nervous equilibrium having been restored, there follows a refreshing sleep during which more nervous energy accumulates in preparation for the next period of activity. This alternating principle of unrest and quiet seems to be a rhythmic law of nature. Hunger and satiety, work and rest, mind activity and repose, are familiar illustrations of this law. But the significant thing for us to note here is the fact that each recurring period of activity, in the case of the infant, means another set of impulsive movements and further additions to conscious experience.

THE SIMPLEST LAW.—I believe that the primary law of earliest development of consciousness in the child is that of *change*, or *variation*. His first awareness of things present to sight is of objects *moving* and thus causing a change of position of the retinal image. He becomes aware of stationary objects only after he is able to move his head, and thus cause a moving retinal image. His first consciousness of things heard is of sounds that come intermittently, as in the case of the human voice, or any other sound of uneven vibrations. Even a mature person soon ceases to hear a noise that is continued with unbroken monotony. These changes in the amount and character of the nervous stimuli impart to the

brain cortex the many nervous shocks, each with its peculiar quality of feeling. In some such way as this, I believe, the child gets his first idea of a "this and that" or of "this different from that."

FURTHER ADVANCEMENT.—Granting this *beginning* of consciousness, the further differentiation of it is more easily explained. During his impulsive arm-swinging the little thumb accidentally slips into the mouth; result, a new, rich morsel of consciousness, one for which he will likely *strive* indefinitely after this. Volition is budding. As the child grows in physical strength the number and variety of physical acts becomes greater and more complex. He can now grasp things in the hand, turn over in bed, sit up, roll over on the floor, and bump and punish himself in a variety of new ways.

The youngster is now a regular attendant at the school of experience, and he is learning rapidly. Let him wallow in the coal-box, burn his fingers, fall and bump his nose, tumble down cellar, and do every other conceivable thing; *provided only*, that he can come out of the experience with his skin fairly intact. In all this he is getting, first-hand, information that is essential to his later conduct. He is ten times better off than the child which is tied in his crib long after he ought to be in rapid action, "for fear he might get hurt."

MEANING OF SELF ACTIVITY.—Ideal conditions of soil, moisture, atmosphere, etc., would not suffice to make an artificial plant grow. The life germ must be present, and then these conditions will bring about development. This growth is the inner nature of the plant in process of asserting itself. It is the *self activity* of the plant. So with animal beings. Given the life principle and the conditions of growth and development and these life processes go on in a manner determined by the inner nature of the creature. The tree has simple digestive and assimilative processes. The higher animal forms have more complex ones with the additional power of locomotion.

The tree, for instance, shows some pronounced reactions. It reaches out with branch and leaf for the sunlight and the rain, and downward with root and fiber for the moisture and the other nutriments in the soil. The horse is capable of obtaining all his necessary nourishment with more highly specialized forms of activity, and of appropriating them to the uses of a much more complex organism. He has two marked advantages over the tree,

viz., that of a nervous mechanism, and that of the power of locomotion. So his self activity manifests itself in a complex way, but strictly in accordance with his horse nature.

MAN'S PECULIARITY.—The human being possesses all the powers and advantages belonging to the tree and the horse, together with a thousand others. He can reason, choose among alternatives, plan for the future, have ideals, love, hate, sympathize, and the like, in a manner peculiarly, and well nigh exclusively, his own. And yet all these acts are but instances of his inner nature forcing itself outward to expression. In other words, these are manifold manifestations of his *self-activity*, and they continue without his effort; yes, almost in spite of his effort.

This brief discussion of self-activity is made here with a double purpose, namely, (1) to indicate the significance of the fact that consciousness *forces* itself upon the individual as time passes. He learns, not so much because he desires to, but because he *must*. (2) It is proper to show that, while it is not within man's power to prevent his conscious experiences, it is entirely possible for him to *modify* and *direct* them, as we shall try to indicate in the chapter on volition, to follow.

IMITATION.—From the very beginning there is prominent a social phase of conscious activity, and we call it imitation. If the term were not so nearly selfcontradictory we might call it unconscious volition. From the child's own standpoint he is *not* imitating, he is merely defining his spontaneous activities in such terms as his environment offers, and in all such acts he continues to widen the scope of his consciousness. There are two important aspects of imitation that might well be noted. The first is imitation of others, and the second, that of the self. Give a three-year old lad a small hammer and some nails and a piece of soft lumber and observe his efforts. He will wield the hammer in fair imitation of what he has seen others do; but this does not aid him much in striking the nail on the head. The latter feat must be accomplished by means of self-imitation. So he begins in earnest pounding away, hit or miss (mostly miss), and finally accidentally strikes the nail square on the head. This last blow gives the boy the thrill that he has been vaguely striving for, and it gives him an image (that is, a fresh memory copy of how it feels to strike the nail) by means of which he can soon hit it again. This random hammer swinging is kept up until accurate aim means simply measuring off mentally,

beforehand, the amount of muscular effort necessary for each coming blow. But this case, or a similar one, can be discussed to better advantage in the next chapter.

We will close the discussion by briefly reminding the reader of the fact that we are all imitators. In dress, bodily attitudes, modulation of voice, gesture and a thousand and one other acts of greater or less significance. We are prone to copy more or less accurately the conduct of our fellow beings. Those persons of highest reputed respectability and those who most nearly exemplify our ideals will be our chief exemplars. Again, let it be remembered that in every case of imitation, whether of self or of others, and whether successful in accomplishing the end aimed at or not, there is being brought about that same continuous enrichment and specialization of conscious experience which was referred to above a number of times.

W. A. MCKEEVER.

STUDENTS' TRIP.

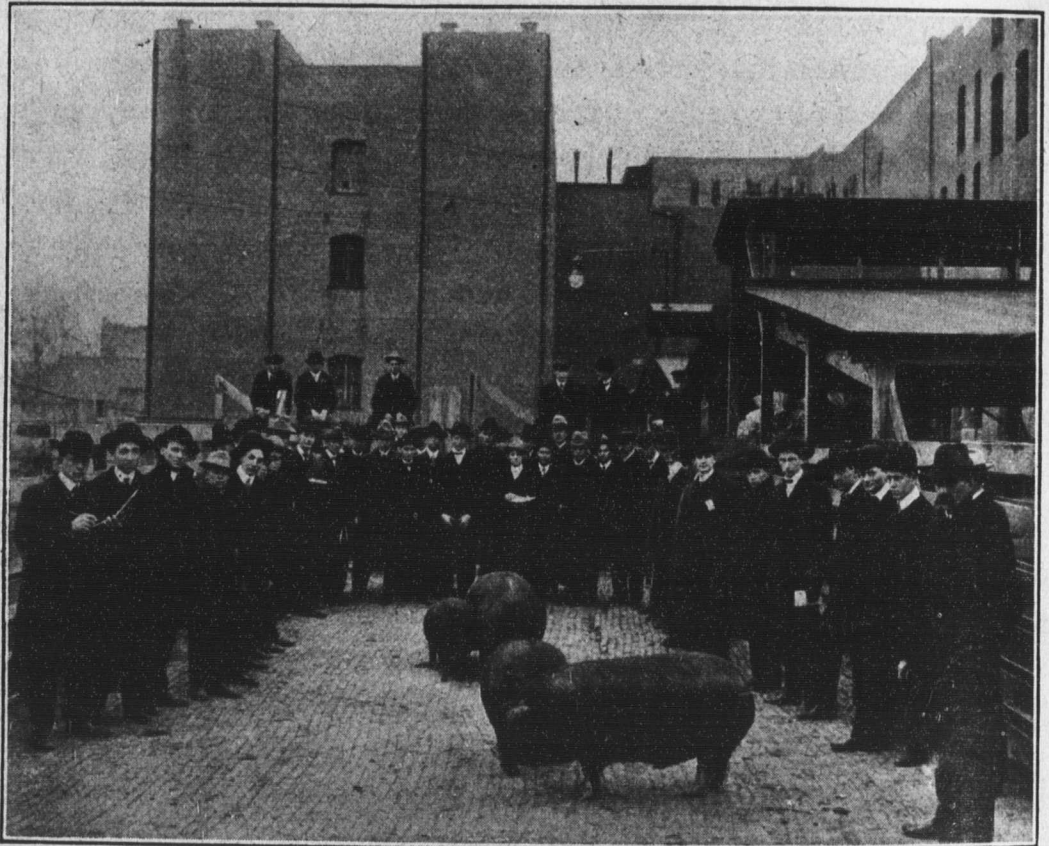
The Dairy and Animal Husbandry Department of the Kansas State Agricultural College arranged an excursion for the benefit of the agricultural students, to visit the packing-houses, creamery and other points about Topeka of interest to agriculturists.

Early Monday morning, March 13, we arrived in Topeka and went directly to the yards of the Wolff Packing Company. Here three hogs and three cattle, each representing a different type of the class of stock, were separated from the rest and judged by the students. Afterward these animals were slaughtered and the dressed meat from each examined, the striking differences in quantity and quality of meat in the different types of well- and poorly-fattened stock being especially noticed.

The departments of the packing house, the different steps in the process of slaughtering and dressing the meat afforded much that was of interest to the students. Our attention was called to three hogs which were condemned by the inspector, two of which were infected with tuberculosis, in different stages of the disease. It could be easily detected by an extremely enlarged and hardened condition of the parotid gland, also in a portion of the lungs which was caseated and hardened.

The process of sausage-making, meat-salting, smoking, storing, pickling and marketing were also observed with interest in the various departments of the establishment.

After dinner we were taken out a few miles southwest of Topeka to the dairy farm of H. B. Cowles. Mr. Cowles has an excellent location for a dairy farm and has improved his opportunity for furnishing milk to the city, by building up a fine herd of Holstein cows. Mr. Cowles has had six of his herd admitted to the advanced registry of the Holstein Friesian Association. Two of



Students judging various classes of hogs before slaughter demonstration at the Wolf Packing Plant, Topeka, Kan.

these are deserving of especial notice: Wyntje Josephine 63805, a 2 year-old which dropped first calf at age of 1 year 8 months 27 days, and after 316 days gave at the rate of 1 pound 2 ounces of butter per day, with an average test of 3.93 per cent; and May De-Laog Mechthilde 63804, a 2-year-old, which dropped first calf at 1 year 10 months 8 days, and after 231 days (during seven days test), gave 221 pounds milk, butterfat 8.64 pounds, per cent 3.9. These records with the excellent condition of the herd are evidences of Mr. Cowles' good judgment in selecting and handling dairy cows.

Mr. Cowles has two large silos with a capacity of 150 tons each. In answer to a question as to whether he considered silage a val-

uable feed, he said, "Yes if I did not have a silo now, I would have one before next fall." This testimony to the value of silage for dairy cows, from one who knows from experience, should help some dairy farmer who has not yet built a silo, to decide to build one for this season's crop and give it a fair trial.

After a short time on the road again we came to the farm of C. W. Merriam, a well known breeder of Shorthorns and Poland-Chinas. Mr. Merriam has a very fine herd of Shorthorns. The general arrangement of barn, yards and fields, makes it a model farm in every way. His barn is so constructed as to afford a maximum of capacity with a minimum of cost. Its capacity is about 200 tons of hay and affords stalls for over 50 head of stock. Mr. Merriam's summer residence and cool mineral spring brought to our minds memories of the "good old summer time" when at the noon hour we could rest in the cool breezes that playfully tossed the green leaves of the shade-trees overhead. It is the ability of the farmer to draw upon unlimited resources of nature to add to his comfort that makes the life of the rural resident most enviable.

As it was growing late we hastened on to the farm of Mr. H. W. McAfee. He kindly showed us through his large barn which is 120 by 125 feet and shelters a large number of pure-bred stock as well as a herd of dairy cows. Mr. McAfee believes in keeping only the best in every class of stock, and the good care which they receive at his hands is shown by their extra good condition.

A striking illustration of the value of alfalfa as a feed is the fact that some of Mr. McAfee's stock are kept in show condition with alfalfa as the sole feed, and with good shelter. His dairy herd consists of a good selection of Jersey cows. Many convenient arrangements were seen, such as a feed-mill with the ground meal lowered directly into feed bins below by gravity, a fan-mill, and other machinery, all run by connection with a gasoline engine.

The next morning was spent at the packing-house again to observe the process of slaughtering beef, and at the pure-milk plant in which the bottling of standardized and pasteurized milk was noted with interest. Mr. Ramsey kindly treated each of us to a drink of the milk as it is sent out to the patrons, and all agreed that it was a most excellent and pure form of the too often improperly handled product. From this place we proceeded to the Continental Creamery Co.'s factory and were conducted through its various departments by the foreman, Mr. Tomkins.

In the afternoon we were permitted to see the store and refrigeration room of the Perry Poultry and Egg establishment, and we there observed the different methods of dressing and packing poultry for the market and for storage.

After visiting other places of interest in and about Topeka, we returned to our college duties, feeling well repaid for the time we spent on the trip. We consider such excursions of great value to the agricultural students of the College. C. W. FRYHOFFER.

TESTING SEED-CORN FOR VITALITY.

[Press Bulletin No. 138, issued by the Farm Department.]

During the past winter the State has experienced a heavy fall of snow with extremely cold weather following, and the question has been asked whether this would materially affect the vitality of the corn, especially that stored in cribs or somewhat exposed. In order to learn the facts as regards the above question, and also to ascertain the average germinating power of the seed-corn of the State, and to determine if possible some of the prevailing causes of low vitality, the Farm Department of the Kansas Experiment Station has undertaken to test samples of corn received from farmers from various parts of the State. It was requested that about twenty ears be selected which represented as nearly as possible the conditions of the crib or of the whole bulk of corn, and that four or five kernels be taken from different parts of each ear, making a germination sample of about 100 kernels. These samples, after notes were taken as to their apparent vitality, were placed in a germinator under like conditions. The results, as given in table below, are based upon germination of 58 samples.

	Number samples tested.	Average per cent germinated by the fifth day.	Average total per cent germinated.
Shock Corn.....	7	78.9	82.0
Crib Corn.....	31	87.1	92.2
Well stored Seed-corn.....	6	94.3	99.0
All of samples tested.....	58	89.7	91.8

While the samples varied in vitality from 31.6 per cent in one sample of shock corn to 100 per cent in several samples of crib corn and well-stored seed-corn, it would seem from the average results as given in the above table that the vitality of the corn of the State is as good as may usually be found, and that the snow and cold weather have done little injury to the vitality. It was not

expected that the weather conditions would have much effect upon the well-stored corn, or upon the crib corn which was well protected, and it is probable that in exposed cribs very little of the snow melted so that the corn would absorb the moisture before the cold weather commenced.

While it may seem to some that each grade of corn has shown a good average germination, it is by no means all that could be desired. The percentage of germination by the fifth day as secured in the laboratory should be accepted as the true germinating power rather than the total percentage, as it is probable that the corn which germinated later than the fifth day would not germinate in the field except under favorable conditions, or would produce weak, undesirable plants. Of the shock corn, 78.9 per cent showed a satisfactory germination as compared with 87.1 per cent by the crib corn, and 94.3 per cent by well stored corn. These percentages are all so low that the progressive farmer should not be satisfied with them. It has been shown by germination tests that kernels from the same ears are apt to have the same vitality, while different ears from the same sample may vary widely in germination, hence if each ear which is desired for planting is tested separately the ears showing low vitality may be discarded, thus seed may be secured all of which will grow. As this is a simple operation it doubtless would pay the farmer to make such a test each year. A very satisfactory way to do this is to carefully select the seed ears, place them on a shelf or table, and after tagging and numbering them select a half-dozen kernels from different parts of each ear, and wrap these separately in a sheet of absorbent paper (about 6 x 10 inches), and marking on each paper the number of the ear. Then after thoroughly wetting, place these samples in a cigar box or some fairly tight receptacle which will retain the moisture, and set in a warm room. If the paper becomes dry, add a little water until thoroughly moistened again. If one or more kernels in any wrapper fail to germinate, or if the kernels germinate slowly, the ear from which these are taken should be discarded.

The well-stored or selected seed corn showed the strongest vitality, 94.3 per cent on the average germinating by the fifth day or 99 per cent germinating in all.

A fair illustration of what good storage may do is seen in two samples of corn received from Mr. W. R. Hildreth, of Altamont,

Kan., the sample from the crib germinating 85 per cent by the fifth day and 86 per cent in all, while the other sample of this corn selected in the fall and kept in the house germinated 100 per cent by the fifth day. Although as an average for all samples, the well-stored corn did not germinate as well as it should have done, yet a comparison of the average germination of the different grades gives us an indication of the importance of carefully selecting, drying and storing corn for seed purposes.

Practically all the samples received were reported to have been well matured before being placed in storage, so that little opportunity was afforded to study the effects of maturity on the vitality of the corn. However, many experiments have shown that lack of maturity is one of the most common causes of low vitality. The seed-corn should be selected fairly early in the fall, so that only well-matured ears will be chosen. If all the corn is well matured the selection should still be made in the fall, as it will be possible to make a better choice then, since the selection may be made from all the corn rather than from a comparatively small portion of it which may remain in the crib in the spring, and also when the selection is made in the field the whole plant may be studied as to uniformity, productiveness, and other desirable features. The selected ears should preferably be stored in a dry and well-ventilated room, which may be heated artificially as cold weather approaches, if this seems necessary, in order to dry the corn thoroughly before freezing weather. If the corn is not well matured this precaution is more necessary. Well-dried corn will not be injured by cold weather provided it is kept in a dry condition.

Late in the winter or in the early spring a further selection of this corn should be made, and only that which upon careful inspection is found to conform most nearly to the desired type should be chosen for planting. It is probable that some of these choice ears which have been kept under favorable conditions will be of low vitality, and hence they should be tested as described above. This work of picking out the best of the seed ears and testing the vitality of the same is a simple operation after the details of the test are once understood, and requires only a few hours work at a season of the year when a farmer may readily spare the time. There is no doubt that this work will be well paid for in the average season in the better quality and increased production of the corn crop.

V. M. SHOESMITH.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS..... Editor-in-Chief
PROF. J. D. WALTERS..... Local Editor
PROF. J. T. WILLARD..... Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres..... Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres..... Sedan
HON. J. S. MCDOWELL..... Smith Center
HON. E. T. FAIRCHILD..... Ellsworth
HON. A. M. STORY..... Manhattan
HON. GEO. P. GRIFFITH..... Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Mid-term examinations, Saturday, May 6.

Dr. C. M. Brink delivered the Commencement address before the Riley high school, Friday, April 21.

On last Saturday evening Professor Willard attended the session of the Kansas City Section of the American Chemical Society.

President Nichols left for Le Roy, Kan., on Wednesday, to deliver an address at the graduation exercises of the public schools.

Assistant Anderson was called to Leonardville Friday by the death of Mrs. Axel Anderson, the wife of his oldest brother. He remained until Tuesday.

The Printing Department received an invoice of paper yesterday to the value of over \$200. The department will use in the neighborhood of \$2000 worth of paper stock during the year.

Last week the Experiment Station mailed Press Bulletin No. 139, containing a treatise on Garget (Congestion of the Udder) of milch cows. The bulletin was prepared by Dr. F. S. Schoenleber.

Prof. D. E. Lantz, formerly of this College, appointed several months ago to a scientific position in the U. S. biological survey, has lately received a salary promotion from \$1200 to \$1500 a year.

Major Granger Adams, of the U. S. artillery, has been appointed by the commanding officer in Fort Riley to make the annual inspection of the cadet battalion of the Kansas State Agricultural College on May 19.

The "city dads" of Manhattan passed an ordinance at their last meeting providing for a large number of new sidewalks and gave a contract for curbing Leavenworth street. Good for the "city dads." The College appreciates these efforts.

The engineers and architects are planning a trip to Kansas City to study practical engineering and building problems. Professor McCormick is trying to secure a special railroad rate, and it is expected that a special car can be secured for the occasion.

Prof. A. M. Ten Eyck went to Wamego Monday afternoon to look at a span of mules for his department. Three new teams of horses have been bought for the College of late. One was purchased of S. P. Woods, of Wamego, one of John Doebeat, of Deep Creek, and one from the Manhattan Transfer Company.

The INDUSTRIALIST has received Circular No. 12 of the Cuban Agricultural Experiment Station, Division of Animal Industry. The pamphlet treats the horse bot-fly and other animal parasites, and is the work of Doctor Mayo, formerly of this College.

Assistant Melick, of the Animal Husbandry Department, is perfecting a new invention—a new dairy drink which he intends to call the Kansas Ambrosia, and which is a mixture of ice-cream and buttermilk. It may be flavored to suit taste, and can be served at all times. Call at the dairy building for a sample.

The College Y. M. C. A. has issued its annual report for the year 1904-'05, a neat little pamphlet of 16 pages in which a complete statement of its work, aims and aspirations is given. We read from its well-written paragraphs that the association is in fine condition and that the building campaign is progressing satisfactorily. Its financial disbursements during the period amounted to \$1431.35.

A students' recital was given in the College Auditorium Friday night, April 14, under the direction of Miss Cecilia Augspurger, assistant in music. Those appearing on the program were Miss Esther Butler, E. C. Farrar, Miss Tillie Harold, Miss Mary Lane, Miss Viola Secrest, Miss Jessie Sweet, Miss Lulu Watt, G. W. Gasser, Miss Gussie Amos, Miss Gertrude Eakin, and Mrs. Grace Wood. The College orchestra played the opening overture.

The College baseball team played three games this week. On Wednesday they were at Baldwin, the score being 8 to 5 in favor of Baker; on Thursday they played the State University, the score being 6 to 1 in favor of Lawrence, and on Friday they measured themselves with Washburn, resulting in a victory for our boys with a score of 6 to 4. The team consists of the following students: Miller, Coldwell, Putnam, Haines, Cunningham, Mallon, Davis, Conwell, Porter, Kahl, Fury, Strong, and Nygard.

Saturday, April 15, the fourth of the series of cross-country runs was held at the College, with five men entered as representatives of the different classes. A wonderful display of speed and endurance, such is as seldom seen, was exhibited to the large crowd of students and townspeople who had congregated to witness the race. The course was 4.5 miles and was covered by Courter, for the seniors, in an actual time of 26.9. Courter was handicapped fifteen seconds per mile, or 1:7, and won the race by 8 seconds. Hastings, for the sophomores, covered the course in 27:25 and Ramsey, for the Juniors, in 27:58. The last cross-country run will be run to-day, Saturday, April 22. It will be ten laps around the track at the park, a distance of five miles. In the last four runs Courter won first place three times. The seniors have practically won the medal and to-day's run will be a contest for second place by juniors and sophomores, although the seniors will take first. Courter so far has the best record of its kind at this College. He is now suffering a slight sprain and may not run in the last race.

ALUMNI AND FORMER STUDENTS.

H. C. Haffner, '00, is now located at Grand Junction, Colo.

Ralph Alm, junior in 1902, has been appointed postmaster at Sharon Springs, Kan.

W. J. Lightfoot, '81, asks that his INDUSTRIALIST be sent to 732 Fifth Avenue, Spokane, Wash.

E. M. Paddleford, '89, writes to have his address changed from Birmingham to Bonner Springs, Kan.

L. B. Jolley, '01, will graduate from the Hahnemann Medical School and Hospital, of Chicago, on the 26th instant.

Edgar T. Doom, student in 1893, after teaching this winter near Riley, visited the College on the way to his home in Ottawa county.

J. W. Berry, '83, was elected president of the Board of Regents at its recent meeting, and J. O. Tulloss, '99, was elected vice-president.

Rachel McCoy [sophomore in 1902], who has been teaching at Stockdale, left Monday for Emporia to attend the State Normal.—*Mercury*.

Mrs. L. E. Strauss [Sue Long, '96], who has spent several weeks here with her sister Mrs. W. M. Stingley and other relatives, returned last Saturday to her home in Topeka.—*Mercury*.

Master Electrician S. R. Kimble, of the United States army, has been ordered to take the examination for a commission as lieutenant and arrived at Fort Leavenworth yesterday for that purpose.—*Nationalist*.

Dr. W. A. McCullough ['98] is in Morris county, where he is superintending the building a dwelling on his farm of about five hundred acres. The doctor expects to move to Delavan, Morris county, where he will practice and look after his farm.—*Nationalist*.

The following letter has been received from J. G. Harbord, '86, captain Eleventh U. S. Cavalry, colonel and assistant chief, Philippine Constabulary: "Seeing your mention in the INDUSTRIALIST of January 14, 1905, of 2nd Lieut. R. W. Ashbrook, 17th U. S. Infantry, a second-year student at the College in 1895, reminds me that your readers may be interested in knowing that on that date Lieutenant Ashbrook was severely wounded in an engagement with hostile Moros on the island of Jolo. A column with which Lieutenant Ashbrook belonged charged a stone fort. As they scaled the wall Lieutenant Ashbrook, gallantly leading his men, received a spear-thrust in the right eye which has cost him its sight and for a time threatened his life. He is out of danger, I am happy to state, and is looking forward to an early return to our own country." Mr. Ashbrook writes from Zamboanga, P. I.; "Until further notice please send my paper to 2731 Olive street, Kansas City, Mo., where I will spend a three-months' leave."

The First Biennial Report of the Oklahoma Board of Agriculture is at hand. This is prepared by the Secretary of the Board, J. B. Thoburn, '93. It contains many valuable articles pertinent to the agriculture of that territory in addition to the minutes of the meetings of the Board of Agriculture. The following sections are treated: "Soils and Climate of Oklahoma," "Gardening and Truck Farming," "Fruit Growing," "Field Crops," "Live Stock," "Dairying," "Poultry," and "Bees." Among the articles is one by H. E. Moore, '91, on "The Dairy Industry and Its Possibilities in Oklahoma," and another by F. C. Burtis, '91, "A Talk to Young Breeders."

George F. Thompson [superintendent of printing here for many years and junior student 1880], of Manhattan, editor of the Bureau of Animal Industry, will travel this summer in European countries for the Department of Agriculture, where he will study various subjects in the interest of the American farmer and stock-raiser. He will visit England, Holland, Switzerland, France, Spain, Italy, and the Malta Islands. Goose farming, cheese making, milk sheep and milk goats will form his principal studies. From the Malta Islands Mr. Thompson will purchase and ship to Washington, D. C., a hundred milk goats for experimental purposes of the department.—*Mercury*.



Students Taking Soil Samples.

Historical Society

VOL. 31

NO. 31

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York).....	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U.S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg).....	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M.S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami).....	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University).....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.).....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.).....	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B.A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., APRIL 29, 1905.

No. 31

PLANT ADAPTATION.*

THAT the varieties of domesticated plants under cultivation vary in productiveness, quality and hardiness in different soils and climates is a fact well authenticated but not fully understood. In the annual convention of the American Agricultural Colleges and Experiment Stations, in 1890, Prof. W. J. Green, of the Ohio Experiment Station, in discussing the subject of variety testing, stated that as a general rule it is true that varieties of fruit which proved best in one state proved best in all other states having the same latitude and similar climatic conditions. He did not consider the difference in location or soil to be prominent factors in determining the value of a variety for any particular locality. Apparently the adaptation of plants is more influenced by climatic conditions than by soil conditions, although doubtless both have their effect on the plants in determining the adaptation of a certain variety for a certain locality. However, I have observed, in studying variety testing of several crops at different Experiment Stations, that the best producing varieties of corn and other grains at one Station are often found to be among the best producers at other Stations, although often the climate and soil conditions are not entirely similar. Evidently there is a great deal in breeding, and in the hereditary power of a well-bred plant to transmit its qualities to its descendants under varying conditions. However, we learn from the origin and development of plant varieties that a variety of fruit or any other plant should not do equally well everywhere and why it should not.

Out of two hundred seventy species of cultivated plants, M. De Candolle has succeeded in finding the wild forms of one hundred ninety-three species. Of the remainder, twenty-seven he considers doubtful as half wild, and the rest he has not yet been able to find in the wild state. Darwin holds that in such cases the cul-

*Read by A. M. TenEyck at the meeting of the Kansas State Corn Breeders' Association held at the Agricultural College, March 2-4, 1905.

tivated plant has either changed so much that its wild prototype can no longer be recognized, or that its original form has ceased to exist. From a single, comparatively valueless, primitive, wild form have originated in the course of time thousands of valuable varieties of plants, all differing from the original, and some to such an extent that they cannot be recognized.

As an example of variation from one type, take the cabbage. The wild plant resembling kale grows native along the shores of the Mediterranean. From it we have the large shrub-like plant, twelve to sixteen feet high, grown on the island of Jersey, and used for canes; the single-head cabbages, varying greatly in size, shape, and color; the cauliflowers, the savoys, and a less-known race, the kohlrabi, with their stems enlarged into great turnip-like masses above the ground. Corn or maize has varied in an extraordinary and conspicuous manner. The different races vary in height from fifteen to eighteen feet to only sixteen to eighteen inches. The size of the ear and its seeds vary in like manner, and the ripening season varies from six to seven months in southern latitudes to three or four in colder climates. We might also consider the thousands of varieties of flowering and foliage plants, roses, pansies, coleus, and of fruit plants, strawberries, apples, and cherries. These examples will serve in some degree to illustrate the great amount of variation in plant varieties.

It is not my purpose here to enter into any discussion as to the causes of these wonderful changes and variations which have occurred in some races of plants. It is self-evident that the characters of plants are hereditary and are transmitted to their descendants, but in addition to inherited properties it is also observed that new characters may appear in some descendants of a plant, characters which were not possessed by the parent plant, or at least not in a noticeable degree, and it is this tendency to vary, which seems to be common in all plants, that has resulted in the existence of so many varieties. Illustrating the tendency to variation which may be found among individual plants of the same variety of wheat, I quote from Prof. W. M. Hays' Minnesota Experiment Station bulletin No. 62:

"Among the four hundred plants of McKendry's Fife, for example, plants were found which matured in ninety-seven days, others requiring one hundred twenty-seven days. Among Power's Fife plants the range was from ninety-eight to one hundred twen-

ty-two days; and among Haynes' Blue-Stem plants the range was from ninety-nine to one hundred twenty-eight days.

"The ten plants which appeared to the eye as the best yielding plants out of the four hundred of each variety were harvested and notes taken as to height of plant, number of spikes, length of spikes, and yield of shelled grain. The following table shows the extremes of the variation in each case:

Variation Among Best Ten Out of Four Hundred Wheat Plants.

Name of variety.	Height of stalk, inches.	Length of spikes, inches.	Number of spikes.	Yield grams.
Haynes' Blue-stem.	31-39	4-4- $\frac{3}{4}$	19-31	15.4-19.4
Power's Fife.	27-33	3- $\frac{1}{4}$ -4	18-33	3.4-13.8
McKendry's Fife.	30-33	3- $\frac{1}{2}$ -4	22-33	6.8-16.7

Similar observations have been made in the breeding of corn by Prof. P. G. Holden, of Iowa. The plants from individual ears varied greatly in leafiness and in size and height of stalks, in the height of ears on the stalks, and in the maturing of the corn, while the yield of corn from rows which were planted with seed from different ears of the same variety or breed varied more than one hundred fifty per cent. At this Station similar results were observed in our ear tests during the seasons of 1903 and 1904. The choice selected ears from the Reid's Yellow Dent seed-corn, which was selected for uniformity and trueness to breed characteristics, showed as much difference in the characters of plants on different rows as might be observed between different varieties of corn, and in 1903 a difference of nearly four hundred per cent in yield was produced by the same area of land planted with seed from individual ears.

In 1904 the greatest range in yield with selected ears of this variety was only a little over eighty per cent.

Plants vary along certain lines. Cultivated plants have varied in the line of their use. The numerous varieties of fruit trees of the same genus differ very little, in general, in their roots, leaves, flowers, and stems, but to an extraordinary extent in the size, shape, color, taste, period of maturity and keeping properties of their fruit. In garden flowering plants, on the other hand, the flowers differ much in size, shape, color, and odor, but the seeds are all alike.

We cultivate the fruit tree for its fruit, the flowering plant for its flowers, *i.e.*, for particular characters. And if these characters vary, or are more strongly displayed in descendants, the

plants are propagated and the variation is preserved. Other characters of the plant also vary, but are disregarded because of no use to man, and so we find variation in one character prominent.

Selection is the process by which new varieties are fixed. Artificial crossing may be used to induce variation, with a view to promote the development of new forms, but selection is always the final process by which new varieties are established and maintained.

Darwin has shown that wild plants vary along certain lines. In their "struggle for existence" only those individuals are able to maintain themselves which are best able to resist the prejudicial influences to which they are exposed, that is, those best suited to surrounding conditions, and only such varieties will reproduce themselves and further develop their special properties. Varieties and species which are not endowed with qualities to endure the struggle for existence perish. As the cultivator develops that which is best suited to his own purpose, so in the struggle for existence only those varieties survive and reproduce their kind which are better adapted through some property they possess to endure the struggle.

By this natural selection, plants become even better adapted for the purposes of self-preservation than cultivated plants are for the purposes of man. Our noxious weeds will serve as an example. Not only do they vigorously sustain themselves in competition with other plants, but it requires the united efforts of men, supported by a weed law, to keep them within bounds. Every wild plant is very accurately adapted to the conditions and circumstances in which it grows and is reproduced. Its organs have the shape, size, mode of development, power of movement, etc., needful for this purpose; if they did not, the plant would inevitably perish in the struggle for existence.

Three principal factors largely determine the value of a variety of any cultivated crop, namely, yield, quality, and adaptation, and the last named is really the deciding factor which determines whether a variety may be successfully grown in any locality. We have learned that plants vary in all their characters, but that in the case of cultivated plants only the varieties are preserved which are of use to man, in the wild state only those which are in harmony with the environments or the surrounding conditions. In

no two countries, perhaps in no two sections of the same country or state, are the plants subject to exactly the same conditions of soil and climate. One section may have a slightly different soil, a little more dry weather, and the plants of this section vary to adapt themselves to these conditions. If the plant is removed from its native habitat, and planted in a different part of the world or country, in a different soil, surrounded by different conditions to those to which it had been accustomed, it is placed at a disadvantage, it is exposed to a new environment to which it is not suited. Thus we can understand why a good variety of fruit or grain does not always give as good results in all places, and we should expect a variety of plants originating from the plants of a certain region to be best adapted for growing in that region. Or such plants may be adapted for growing in any region having similar conditions of soil and climate. We find a demonstration of this principle in the fact that wheat and other grains, brought from the steppes of Russia and Turkey, are well adapted for growing in the western plains region of the United States, which has a climate and soil very similar to that of the countries named. The Turkey Red wheat, for instance, has largely replaced all other varieties of winter wheat grown in the West, because of its greater hardiness and productiveness, and yet some of the varieties which it has succeeded had been grown in the West for many years and seemed to be fairly well adapted to western climatic and soil conditions. This superior hardiness and adaptation which the Russian and Turkey varieties of grain appear to have in our western country may be largely credited to the centuries of training which these varieties have had in an environment almost identical with that of similar latitudes in the West, while the varieties which the Russian grains succeeded, as a rule, have been those which have been gradually moved from the eastern and middle states farther west, and although many of these varieties have gradually become more or less hardy and fairly well adapted for growing in our western climate, yet, in the comparatively short period during which they have been grown under western conditions, apparently they have not become so hardy and well adapted to those conditions as the Russian and Turkey varieties.

We have growing throughout the west a large number of grasses and native grains which are fully hardy and perfectly adapted to the conditions under which they grow, and we have ne-

glected to a large extent to develop these native grasses and grains. One of the urgent needs of western agriculture to-day is for domestic grasses which can be successfully and profitably grown for pasture and meadow and in rotation with other crops. Previous to the introduction of *Bromus inermis* there was practically no domestic grass which could be grown successfully throughout the central and western portions of Kansas, and this grass is not fully adapted, especially for the extreme western and southern parts of the State. Also, in some soils it does not seem to thrive well. We ought to develop domestic grasses from our native grasses. These wild grasses are just as capable of producing valuable cultivated varieties as were the wild prototypes of many of the valuable domestic grains and grasses which we are growing to-day. This work is being undertaken by the Botanical Department of this Experiment Station, and although little has been accomplished thus far, yet the work is of the greatest importance, and it is to be hoped that in time valuable varieties of cultivated native grasses will be developed.

Probably more has been done along the line of developing the wild fruits of the United States than with any other class of native plants, and yet improvement in this line has been slow and costly. In speaking on this subject, Prof. N. E. Hanson, of South Dakota, the great fruit breeder of the northwest, says: "It has cost considerably over one million dollars to determine that the apples commonly grown in the eastern and southern states, which came originally from western Europe, cannot be successfully grown over a large portion of the northern Mississippi valley, and many thousands of dollars are being spent annually in every state of this vast region in order to demonstrate this fact still farther." Professor Hanson's plan is to develop the native fruits, either by selection or by crossing the best native varieties with the cultivated varieties, the aim being to combine the hardiness of the wild fruits with the size and quality of the cultivated varieties. Professor Hanson has accomplished some wonderful results with cherries, plums, and small fruits, and largely through his efforts, directly or indirectly, the northwest is to-day supplied with many native cultivated varieties of fruits which are not only productive and of good quality but are perfectly hardy in the conditions and climate in which they grow.

I quote some of the thoughts and facts which Professor Hanson,

as a noted worker and authority, has expressed in his writings and in the bulletins of the South Dakota Experiment Station, as follows: "The wild fruits are already superior in hardiness, as summers and winters of many centuries have acclimated them, and weeded out individuals of insufficient vigor. . . . We must create a new pomology. About all the varieties familiar to eastern fruit growers are tender and worthless on the open prairies of a large part of the Dakotas, Minnesota, northern Iowa, and the Canadian northwest. . . . Plants from a comparatively mild, moist coast climate are not adapted to a dry continental climate. Man readily adapts himself to such environments and finds the climate salubrious, but plants have no power to provide against such changes. Plants from the drier, interior northern portions of Europe and Asia prove hardy in South Dakota. . . . Many plants cannot adapt themselves to a change in location nor to cultivation in open exposure. Some hardy, native plants, which flourish in sheltered places or on moist land, fail on dry upland. Some plants are strong and aggressive, while others are retiring and dependent. . . . It is now a well-established fact that a species of plant extending over a wide geographical range varies greatly in ability to resist cold. Southern box-elders winter-kill in Manitoba; box-elders from Virginia winter-kill in Iowa; box-elders from Kansas kill to the ground at this station; yet in each case the local native box elder is perfectly hardy. . . . Dakota planters should make sure that their ash, box-elder, elm and other native trees to the state are not grown from seed picked too far south. Conversely, it is not best for southern planters to get seed from too far north because the term '*hardiness*' implies ability to *resist heat* as well as cold. . . . This variation in hardiness points to a slow process of acclimatization by nature. De Candolle writes in 'The Origin of Cultivated Plants:' 'The northern limits of wild species . . . have not changed within historic times, although the seeds are carried frequently and continually to the north of each limit. Periods of more than four or five thousand years, or changements of form and duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold.' We should take full advantage of this great work done for us by nature in acclimating plants, and cultivate our local form of the native species instead of the form adapted in the course of thousands of years to a mild,

moist climate. This fundamental thought: to work with, and not against nature in the adapting of plants to our prairie climate, underlies all efforts in the improvement of plants."

Hardiness requires fixed characters in the plant, and this is exhibited by wild plants which, being perfectly adapted to certain environments, change very slightly, if at all, even during the lapse of centuries. These wild plants when grown under cultivation are surrounded by new conditions, which cause them to vary in their characters, and it is true of our cultivated varieties that under the various conditions in which they are grown there is much greater tendency to variation in the characters of the plants than is found in the wild plants of the same species. From the experiments of breeders and from general farming experience it would appear that changes in quality, productiveness and other minor characters of plants occur much more readily than changes which tend to produce hardiness or better adaptation to new or unsuitable environments. The changes by which plants become more hardy and more resistant to unfavorable conditions doubtless take place very slowly, yet with annual crops, especially those which are produced from seed, changes by which the plant becomes better adapted to the conditions in which it grows evidently take place much more rapidly than with wild plants. Not only do we have the general experience in western agriculture to prove this proposition, but the experiments which have been carried on in different states in changing seed and the testing of varieties prove not only that seed grown in different localities is better adapted for growing under certain conditions than other seed, but also that varieties become gradually more productive and more vigorous and hardy as they are grown in a certain climate and soil.

As reported in Bulletin No. 39 of the North Dakota Experiment Station, it was found, in exchanging seed wheat with the Minnesota Experiment Station, that when the new seed was simply the old variety, the home-grown seed proved to be superior in yield. As an average of many tests, the home grown seed yielded three and four-tenths bushels more wheat per acre than the seed of the same varieties brought directly from Minnesota. However, it was observed, when several varieties of Professor Hays' selected wheats were introduced and grown at the North Dakota Experiment Station, that these varieties gave larger yields than the best home-grown seed of the old varieties. Again, when the selected wheats

had been grown a few years at the Dakota Station, and new seed of the same varieties was again introduced from the Minnesota Station, the older seed of the improved varieties proved to be the better yielder by several bushels per acre, indicating that in the interval of two or three years the selected wheats had become better adapted for growing at the North Dakota Station than the same variety of seed from the original source.

At the Nebraska Station, as reported in Bulletin No. 72, it was found in testing the adaptation of varieties of winter wheat during a period of five years that a certain few varieties were much hardier and much better adapted for growing than others. "Samples of wheat of the same variety, but grown in different parts of the country, when grown side by side showed much difference in their habits of growth, which were greatly to the disadvantage of the seed grown east of the Missouri river." It was noted, also, that there was a tendency on the part of the alien wheats to adapt themselves to the local conditions when grown at the station for a number of years. "Kansas-grown seed matured earlier and yielded better, but entirely winter-killed, when the Nebraska- and Iowa-grown seed passed the winter successfully."

It does not always follow, however, that home-grown seed of certain crops is better adapted for growing in a certain climate and soil than imported seed. At the Alabama Experiment Station, as reported in Bulletin No. 111, in a five-years' trial in exchanging seed-corn, it was observed that the seed-corn from Illinois gave slightly larger yields than the seed from the Gulf States region, while more satisfactory yields were obtained with the seed from both the north and the south than from the home-grown seed of the same variety. "Late varieties from the north made good yields at Auburn, but the smallest yields were made from early varieties of northern origin." Also in Colorado, as reported in Bulletin No. 57, the results of experiments in testing seed-corn from different altitudes and latitudes were not all uniform. The eastern-grown seed from Massachusetts, Pennsylvania, and New York, on the whole gave better yields than seed grown west of the Mississippi river. The northern-grown seed gave less yields than home-grown seed for the Pride of the North and much better than the home-grown seed for the Leaming variety. Excepting the seed from the eastern states it would appear that the difference in seed was largely a matter of adaptation of variety, and that the Pride of the

North was a variety well adapted for growing at the Colorado Station.

Many farmers have made it a practice to change seed of wheat and other crops occasionally, claiming that when they grow the same seed for a long period it runs out and becomes less hardy and productive than it was when first introduced. If a crop is not adapted for growing in a certain region, doubtless there is an advantage in getting new seed occasionally from the sources where the crop grows to perfection, but if a crop is adapted to a certain climate and soil, or has become adapted by a long period of planting and selection, nothing would be gained and much would be lost by introducing new seed of the same variety from the original source. If a better variety or a better strain of the same variety was obtained, there might be some advantage in changing seed, as was shown by the experiments at the North Dakota Experiment Station, when Professor Hays' selected wheats proved superior to the best home-grown seed of the old varieties. Kansas is well adapted for growing corn and wheat, and it is a question whether any advantage may be gained by changing seed with a foreign state, unless the new seed is a better bred or improved variety; but with oats it may be different. Apparently, oats are not well adapted for growing under Kansas conditions, and until we secure hardier and better adapted varieties it is probably advantageous and necessary to introduce new seed of oats from those states where oats grow to greater perfection than in Kansas. The same may be said also of potatoes, although the tuber is not really a seed, yet perhaps the same principle applies with potatoes as with oats.

[TO BE CONTINUED.]

The Board of Regents, at its April meeting, authorized a four-years' course in veterinary science which, after the necessary details have been worked out, will be adopted at the next meeting. The first two years of the course will be identical with the present agriculture course. The junior and senior years will contain much work in materia medica, bacteriology, animal anatomy, animal hygiene, surgery, and other studies of a similar character. The course will be open for students in September and will undoubtedly be popular from the start.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY [88], Pres.....Jewell City
HON. J. O. TULLOSS [99], Vice-Pres.....Sedan
HON. J. S. McDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Professor Dickens says that most fruit, especially the apples, are safe, even if the peaches and plums shall prove to have suffered on account of the late frosts.

The lecture course committee has secured Doctor Gunsaulus, president of Armour Institute, Chicago, to lecture as a substitute for Doctor Conwell. The lecture, which is the last of the course, will be given May 19.

Professor Erf is having the floor of the cheese cellar in the Dairy building cemented. The work is being done by Walters & McGregor, the firm that lately contracted with the city to curb Leavenworth street.

Third-year student E. A. Cole and second-year student A. Hassman enlisted this week in the engineering corps of the United States Army. Their company, stationed at present in Fort Leavenworth, will sail for Manila in June or July.

Professor Roberts has done much work this spring in grading and planting about his new suburban home, near the west end of Poyntz avenue. In a few years, when the trees and bushes will be larger, the professor will have one of the finest homes in central Kansas.

This afternoon, Saturday, April 29, the College baseball team meets the Colorado University boys, who are on a trip for games with the Universities of Nebraska and Kansas. This team is one of the strongest university teams of the West and should be able to keep the boys busy.

The Manhattan Horticultural Society held a meeting on April 27 in Horticultural Hall. The program included the following: "Starting, Planting, Cultivating and Marketing Sweet Potatoes," Messrs. Farmen, Moore, Harshaw, Handlin, Freeman, and Popenoe. There was also a report of the committee on fruits.

Professor McCormick has made some interesting tests with the new Miles cement-block machine recently presented to the College by the Miles Manufacturing Company, of Jackson, Mich. Two men of his department made in one day one hundred twenty-one blocks 10 x 24 x 8 inches, some of them with rock faces and others with smooth faces. The machine worked nicely from the start. The professor will submit the manufactured block to different tests and promises to publish the results in the *Industrialist*.

Asst. Harry Brown, with his military band, will give the seventh annual May festival concert, at Wareham's opera-house, next Monday evening. The band is better than ever before and will be assisted by several out-of-town players. Mr. B. R. Jackson, euphonium soloist, Mrs. Cora E. Brown, harpist, and Miss Adelle Blachly, soprano soloist, will also take part and thus add much to the attractiveness of the program. Tickets 35 and 50 cents.

The exhibition of the girls' classes in calisthenics, given last Thursday night in the Auditorium, was well attended and a grand success in every particular. Every number of the program showed the results of careful training in elastic and positive movements and the graceful evolutions of the groups. The solo performance of Miss Barbour, the teacher of the classes, was especially fine. The music was furnished by the College orchestra. Miss Harold played for the drills.

ALUMNI AND FORMER STUDENTS.

George Doll, '97, has changed his address from Larned to Lewis, Kan.

E. W. McCrone, '03, is to be addressed now at Callao, Mo., instead of Kansas City.

Alexis J. Reed, '03, hereafter will receive his *Industrialist* at 12 Stanley Terrace, Chicago, Ill.

Hope Brady, '98, has returned to her home in Manhattan after another year of successful work in the Liberal city schools.

Sadie (Moore) Foster, '94, and her husband, Arthur G. Foster, of Seattle, Wash., are very happy in the birth of a son, April 13. The youngster has been named for his father.

F. E. Johnson, '99, finds that the *Industrialist* is like bringing him face to face with old friends. In his work in the Bureau of Animal Industry his post-office changes frequently. It is now Hyannis instead of Alliance, Neb.

Gertrude (Havens) Norton, '96, after a prolonged struggle with tuberculosis, died in Manhattan Monday morning, April 24. The sincere sympathy of many friends will be with her husband, J. B. S. Norton, '96, and their two little ones, the youngest of which is but a few days old.

In a letter recently received from H. B. Holroyd, '03, he says: "Having completed my course in forestry at the University of Michigan, I am in charge of the Department of Forestry at the Ontario Agricultural College, Canada, during the absence of the regular professor who is now on leave of absence. In connection with my work this spring we will establish several nurseries in different parts of the Province, the principal ones being near Toronto and at Georgian Bay."

Kate (Oldham) Sisson, '92, and her husband, Septimus Sisson, once a student, and recently associate professor of veterinary science here, and now professor of comparative anatomy in the College of Veterinary Medicine, Ohio State University, will sail for Europe June 14. Steamer letters may be addressed them: Steamship Main, Pier No. 9, Locust Point, Baltimore, Md. Doctor Sisson has a year's leave of absence on half salary, a consideration which shows the high appreciation which he has won during his four years' service. They will take a few weeks vacation visiting relatives in England and then go to Germany. The Doctor's plans for study there are not fully matured, but he will probably work mainly in the University of Berlin and at the Royal Veterinary College there. Later he will make a tour, visiting various schools on the way.

Marian Hubbard Graham Bell, daughter of the inventor, Prof. Alexander Graham Bell, and David Grandison Fairchild ['88], foreign explorer for the Agricultural Department, son of the late Prof. George T. Fairchild, President of the Kansas State Agricultural College, were married to-day at "Twin Oaks," on Woodley Lane road, just outside Washington. The ceremony was performed on the lawn. The bridal party stood under two great oaks which give the place its name. The bride had no attendants. She was escorted from the residence to the grounds by her father, where Mr. Fairchild and his best man, Charles L. Marlatt ['84], awaited them. She wore a rich gown of white satin trimmed in point lace with tulle veil and carried a bouquet of cherry blossoms. The bride is one of the heirs to the millions made from the Bell telephone system and received a dower of one million dollars. She is devoted to the study of electricity and a constant companion of her father in his researches.—*Associated Press Dispatch.*

Ben. Skinner, president of the famous class of '91, sends the following letter for publication:

To the Class of 1891: "We want the Earth." After fourteen years of active participation in the struggle for existence it presents itself to me as a suiting thing for us to meet at the triennial gathering this year and report progress. There has not been a time during these years that I have not been able to recall the old associations with feelings of tenderest sentiment. I am sure we owe much to our Alma Mater. A little time and a little money spent this June will brighten life for us and encourage the workers of our dear old College. "Shall old acquaintance be forgot?" You will lay down "The White Man's Burden" for a while, come and join the merry-makers and live again *the happy days*, dividing the sorrows of the present and multiplying the joys of the future. All members of this class unable to attend will take the trouble to write a personal history from 1891 to 1905, with cartoons, notes and comments, and mail it to the "Class of '91," in care of College, in time for the meeting. With kindest regards and best wishes for all, I am

Yours truly,

BENJ. SKINNER.

AN OPEN LETTER TO THE ALUMNI.

The Triennial Reunion and Banquet of the Alumni Association of the Kansas State Agricultural College will be held Commencement week, June 11 to 15, 1905. This will without doubt be the largest gathering of graduates and former students in the history of the College. Everything indicates that a large number from nearly every class will be present and help make the week one of great interest and enjoyment.

Every alumnus has greater cause than ever before to be proud of the College. Since the last reunion, besides additions to older buildings, the Physical Science Hall, the Dairy Building and the Auditorium have been completed and equipped. For the first time in many years the executive committee can assure you that every alumnus will be provided a good seat at all the exercises of the week, which as now announced will be: Baccalaureate sermon on Sunday, the class play Tuesday evening, the Alumni address Wednesday evening, and the Commencement address Thursday morning. The business session of the association will be held in the old chapel Wednesday afternoon at 3:30. Arrangements are being made by the literary societies to hold society reunions at 1:30 Wednesday afternoon, and class reunions will be held the same afternoon after the business session.

The arrangements for the banquet Thursday evening are well advanced, and it is confidently expected that it will be in every way an occasion of rare enjoyment. The banquet will be served early in the evening. The menu will appeal to every hungry alumnus and the list of after dinner speakers insures an intellectual treat of unusual merit.

The alumni address, Wednesday evening at 8 o'clock, will be one of the attractions of the week. It will be delivered by Frank A. Waugh, '91, now professor of horticulture and landscape gardening at Massachusetts Agricultural College. The place now held by Waugh as an author and speaker in eastern circles is a prominent one, and his address will be an able one. The music during the week will be of such quality, quantity and variety as to add very largely to the pleasure of all.

We believe that no argument is needed to induce every child of the College to make this an "Old Home Week" of such a character as to be worthy of the men and women of the Alumni Association. The memories of College days and College friends are, in the minds of most college-bred people, in a class alone and apart. It is well worth while to refresh and indulge them now and again. Letters from a considerable number of members evince a warm interest in the coming meeting, and it will be well worth while for members to plan to come.

Reduced rates on the certificate plan have been assured by the railroads, good from all points in the State and Kansas City and St. Joseph, Mo. Later a personal letter will be sent each member, with a return card for reply, that we may ascertain the number of members of his family to be provided for. In the meantime, plan to come.

Fraternally yours,

MARGARET MINIS, *Secretary.*

ALBERT DICKENS, *President.*

Historical Society

VOL. 31

NO. 32

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.)....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.),	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University)	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg)	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.),	Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.),	Assistant Professor of English
CLARENCE L. BARNES, D. V. M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B. S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B. A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MAY 6, 1905.

No. 32

PLANT ADAPTATION.*

[CONCLUDED.]

VARIETY TESTING.

Although a large amount of variety testing has been carried on at the Experiment Stations throughout the United States, yet apparently little has been accomplished towards the permanent improvement of crops by mere variety testing. The methods employed by most of the Stations have simply been the testing in a small way of a large number of varieties. This has usually been continued only a few years at a time, when by a change of men or reorganization of the work the variety testing has been dropped for a time and the seed lost, so that the variety has often entirely disappeared, and in some states ten years from the issuing of one bulletin the Station will be testing an entirely different and new lot of varieties. In order that the testing of varieties by the Experiment Stations may become of permanent value and use to the farmers, seed selection must go on with the variety testing. The best selected varieties should be planted in "increase plots," and the seed thus secured should be distributed among the most enterprising farmers of the State, who may be induced to purchase such seed at a fair price, and should be encouraged to engage in growing the seed for further sale and distribution among their neighbors. By combining breeding and selection with variety testing and distributing the seed of the best-producing varieties among the farmers, a vast amount of good may be accomplished. Instead of simply getting a record of what certain varieties will produce and then dropping them, the propagation and distribution of the best producing varieties by some such method as suggested above will cause these improved varieties to be widely grown, and a few years' work along this line by the Experiment Station of any state should result in the introduction and cultivation in each state of the best varieties which will greatly improve the average yield of

*Read by A. M. Ten Eyck at the meeting of the Kansas State Corn Breeders' Association held at the Agricultural College, March 2-4, 1905.

standard crops, and eventually add greatly to the material welfare and prosperity of the state.

In studying the reports of the variety trials of the several standard crops at the Experiment Stations in different states, to one who is unacquainted with the work of variety testing the first surprise is the vast number of varieties which are grown, and the few of the same name that are grown throughout any large area, and an even greater surprise is the great variation in the productiveness, quality and hardiness which is observed between different varieties. Only a few of all the varieties tested at the different stations prove to be superior in all the qualities which make a certain variety more valuable than others. For instance, after five years' (1897-1901) testing of wheat at the Nebraska station as published in Bulletin No. 72, of the one hundred eighteen varieties grown only two, Turkish Red and Big Frame, were found to have sufficient hardiness and productiveness so that they could be recommended for general growing in that state. At the Kansas Station, as reported in Bulletin No. 71, out of some fifty leading varieties which had been grown at the station for several years only three, the Turkey, Tasmanian Red, and Crimean, withstood the winter of 1896-'97 so as to yield at the rate of ten bushels or more per acre. In the two tests noted it will be observed that the want of hardiness or adaptation was the principal factor in determining which was the "best" variety. In 1903, some seventy-nine varieties of corn were grown in our variety test at this Station, and the yields of what were considered as "standard" varieties varied from less than thirty to more than eighty-nine bushels per acre. In a test of twenty varieties of oats, the yields ranged from nineteen to fifty-three bushels per acre, and among twelve varieties of barley there was a range in yield of from seventeen to thirty-three bushels per acre. These tests were repeated in 1904 with similar results, although the range of difference in yields was not so great as in 1903.

When we observe this great variation in productiveness and hardiness of different varieties grown under similar or practically the same conditions of soil and climate, we must admit that there is a great difference in varieties, and that some varieties may be grown by the farmers at a much greater profit than others. It is certainly to the interest of the farmers to secure and grow these "best" varieties, and it is the plan of this Station to propagate and distribute

some selected seed of all the best producing varieties of standard crops as shown by the testing at this Station; in fact, we are already engaging in this work. During the present year the Farm Department has sold and distributed among the farmers of the State some two hundred bushels of selected seed-corn. We are also distributing seed of the best varieties of oats, barley, emmer, cow-peas, soy-beans, and Kafir-corn.

The question arises as to how widely these "best" varieties may be adapted for growing in this State. Will the corn which produced well at this Station produce well all over the State, wherever corn is successfully grown. From a study of variety testing at the Experiment Stations it is evident that some few varieties of wheat and corn have proved to be among the best producers through a wide area of country. The Fultz wheat, for instance, which is one of the best producing varieties of the soft red type of wheat at this Station, is also one of the best producers at the Kentucky and Tennessee stations and has a wide adaptation. Likewise the Reid's Yellow Dent corn, which originated in Illinois, is now being grown successfully in Iowa, Nebraska, Kansas, and Missouri. Although as stated, some varieties are grown successfully throughout a large area of country in different soils and even under somewhat different climatic conditions, yet even the "best" varieties are not fully adapted to the new conditions and gradually become better adapted, as shown by the experiments in changing seed wheat at the North Dakota Experiment Station.

It would be interesting to know just how these "best" varieties have originated and why they are superior to others in their class. Some, like the Turkey wheat and Russian varieties of grain, are evidently "best" largely because of their greater hardiness or power to resist the adverse climatic and soil conditions, which character they have acquired by centuries of adaptation in a similar climate and soil. Some varieties, and this may be more general than can be proven, are "best" because they are better bred. The record of the origin of some of the "best" varieties has been kept. With wheat, for instance, several of the leading varieties, such as the Fultz, White Clawson, and Blue-stem, according to Prof. Andrew M. Soule, of the Tennessee Experiment Station, have been originated by "picking out what are apparently spotting heads of wheat from large fields and 'roguing' them until a distinct character of head and grain has been secured." The Power's

Fife wheat, for many years one of the best producing varieties of Scotch Fife wheat grown in North Dakota, originated from a single plant which was found growing in the edge of an oat-field. Of the six improved varieties which have been originated by Professor Hays, of the Minnesota Experiment Station, four, including the three best producers, came from selected individual parent plants, and were produced by continued plant selection lasting for several years. The others were in-bred crosses, namely, two selected plants of the same variety were crossed, and from the plants produced from these crosses the best individual plants were selected for a number of years, finally establishing the improved variety. Thus these varieties have been established by what is really a type of intensive in-breeding, which has largely destroyed the tendency to variation in the plants and fixed very strongly their type and character, so that it is uniformly produced even under changed environments. A good variety of any crop from this standpoint is simply due largely to the prepotency of plants which have the hereditary power to reproduce their characters, and such varieties will produce well wherever the climatic conditions will allow the plants to grow and mature.

Although these well-bred varieties may have a wide distribution, yet improved varieties may be developed locally which are superior to the best introduced varieties. The place to breed drouth-resistant crops, for instance, is in the region where they must grow, and this principle is more or less applicable to the breeding of plants in any locality.

I believe in the local testing and breeding of crops. The proposition to use the county poor-farms as sub-experiment stations is a good one. By making use of the county poor-farms in different parts of the State for the testing of varieties and the selection and breeding of those varieties found best adapted for growing in that district we would soon be able to produce and distribute to the farmers of that section varieties which are better bred and superior producers to those which the farmers are at present growing. There are many local differences of soil and climate which require crops especially adapted for those conditions, and there is little question but that there are some varieties which are better adapted for growing on certain kinds of soil than others. It was found by experiment at the Tennessee Experiment Station, as reported in Bulletin No. 2, Vol. XVII, that the Hickory

King corn was better adapted for growing on upland than Cocke Prolific, while on the bottom-land and fertile soil Cocke Prolific was by far the better producer. Again, in testing the different varieties on manured and unmanured land it was found that while Cocke Prolific responded well to manuring and gave largely increased yields, the Hickory King received comparatively little benefit from the application of manure. At this Station, in 1903, the Iowa Gold Mine corn proved to be an inferior yielder in the regular variety trial on heavily manured land, but on a poor piece of upland, on another portion of the farm, the Gold Mine proved to be the best producer out of twelve varieties, eleven of which gave larger yields than the Gold Mine on the fertilized land.

It is also a well-established fact that certain grasses and grains are well adapted for upland or light soils, while others are better adapted for bottom-lands and the more fertile or better watered soils. In order to obtain varieties adapted for all sections of the state it may not be necessary to originate new varieties. On the other hand, I should prefer to reduce the number of varieties of the different crops which are at present cultivated, and by selecting a few of the best varieties, and growing and breeding them locally, a local adaptation may be effected by which the seed of a certain variety may become superior for planting in a certain part of the country. It will not be necessary to have a different name for the corn of each section. Reid's Yellow Dent, for instance, may perhaps be bred and adapted for growing successfully throughout the whole corn-growing portion of this State. The corn would be Reid's Yellow Dent wherever grown, but each section of the State would have its particular strain of seed, differing little if any in type from corn grown in other sections of the State, but differing much perhaps in adaptation to a certain environment.

In this discussion, I have, perhaps, not given any very definite information. I find that plant adaptation is a subject upon which very little has been written. The subject is more or less theoretical and has not been developed, and there is little definite information to be had on the subject. My purpose has been largely to gain your interest and call your attention to the possibilities of crop improvement which may be secured by introducing and breeding more productive varieties better adapted to the conditions in which the crops must grow than are the varieties now being grown.

THE STEAM-TURBINE.

ALTHOUGH the application of the steam-turbine to commercial power generation is a very recent achievement in the engineering field, yet its history dates back to 120 years B. C., when the Eolypyle, as used by the Egyptian priests, was described by Hero of Alexandria in his book on pneumatics. That oldest type of a steam-turbine consisted of a hollow ball placed over a fire, and made to rotate by the reaction of a steam jet exhausting from two nozzles pointed at opposite directions. Nothing of great importance was accomplished towards the development of the turbine between Hero and 1629 A. D., when Giovanni Branca, an Italian architect, employed a jet of steam to impinge upon a series of buckets on a wheel, causing the latter to rotate about its axis. Although there were many turbine patents taken out between the time of Branca and De Laval, yet the successive expansion turbine of Pilbrow and the Touraine Turbine were the only ones which aided the development of the present commercial types. Pilbrow was the first to invent the method of reducing the bucket velocity by passing steam through a number of rings or buckets in series, but the greatest credit must be given to the French mining engineer, Touraine, for his clear presentation of the principle of the many stage reaction turbine. Touraine's turbine consisted essentially of a series of fixed and movable vanes through which the steam is passed and expanded.

Before taking up the commercial turbines of to-day, let us try to account for the fact that the steam-turbine, the principle of which was known as early as 120 years B. C., was not developed until recent years. There is very little doubt that the Branca steam-turbine could have competed with the other prime movers of that date in economy, if it could have been constructed in commercial sizes, but the following factors prevented its development in commercial sizes: *First*, the knowledge of metallurgy of that time could not produce material capable of bearing, without rupture, the tremendous rotative speeds with which we have to deal in the case of steam-turbines. It is due to the great progress in mechanical constructions that we are able to obtain materials of such quality and refinement that we are enabled to handle safely all problems arising from the immense centrifugal forces. *Second*, the uncertainty of the phenomena which govern the flow of steam through straight or bent tubes. Thanks must be given to the

great scientists of this century in general, and to Zeuner and Hirn in particular, for aiding us to overcome this difficulty. Besides the above drawbacks it must be added that the great development of electrical engineering is responsible, to a great extent, to the utilization of the turbine as a prime mover.

The commercial steam turbines of to-day are divided in two classes. (1) Impulse turbines. In this case we must differentiate between (a) the single-action impulse types, of which the De Laval is an example, and (b) the multiple-action impulse types, of which the Curtis, Riedler-Stumpf and Rateau are examples. (2) Action and reaction turbines of which the Parsons is the only successful type. In turbines of the first class the original impact element is made use of in the simple or compound form, the pressure fall being secured by nozzles. In the turbines of the second class, the turbine buckets perform the function of both bucket and nozzle as well. In the first class the energy is due to velocity only, while in the second class it is due to pressure and velocity.

THE DE LAVAL STEAM TURBINE.—The turbines of this type consist essentially of a turbine wheel mounted on a very slender shaft and an expanding nozzle. The steam, after passing through the nozzle, is completely expanded and in blowing through the buckets of the wheel, much of its kinetic energy is transferred to the turbine wheel. After performing its work the steam goes out through an exhaust opening to the condenser or to the atmosphere, depending on whether the turbine is condensing or non-condensing. As the velocity of the turbine wheel and shaft is too great for practical utilization direct, it has to be reduced by means of a pair of spiral gears, which are made usually ten to one ratio. There is a coupling on the power shaft which can be connected to a dynamo or extended to a pulley.

The great objection to this turbine is the fact that it has to be run at very high speeds, the total energy of the steam having to be utilized in an expanding nozzle in the production of velocity. It can be shown thermodynamically that steam, expanding from one hundred sixty-five pounds pressure absolute to one pound absolute, or twenty-eight inches vacuum, will attain an absolute velocity of four thousand feet per second. Now, for the best efficiency it is necessary that the peripheral speed of the turbine wheel should be about one-half the absolute velocity of the steam at the entrance, or in this case about two thousand feet per second.

Two thousand feet per second is too high a speed for commercial purposes and safety, and the Curtis turbine tries to reduce this in the manner explained below.

THE CURTIS STEAM TURBINE.—In the Curtis Steam Turbine, which is manufactured by the General Electric Company, of Schenectady, New York, the velocity is imparted to the steam in an expanding nozzle and is fractionally abstracted and largely given up to the moving element. The action of the turbine is as follows: Steam from the steam-chest enters an expanding nozzle and then impinges upon the first row of moving buckets. The direction of the steam is then changed by the intermediates, or stationary buckets, and the steam enters the second row of moving vanes. After passing three sets of moving buckets (in the old style machines) or two sets (in the new styles), the steam enters a second stage, where the steam is again expanded in a nozzle and the operation is repeated once more. The Curtis turbines utilized two or more expansions or stages so as to completely utilize the expansive force of the steam. The early commercial Curtis turbines utilized three or four rows of moving buckets and two stages, while the latter machines utilize only two rows of moving buckets and four stages. The Curtis turbines are being constructed as horizontal machines up to five hundred kilowatt. From five hundred kilowatt up, the vertical arrangement has been found to give more satisfactory results.

THE PARSONS STEAM TURBINE.—Another method of avoiding very high peripheral speeds is utilized in the Parsons turbine. The expansion is carried out within an annular compartment which essentially corresponds to a nozzle. The difference, however, is that whereas in the nozzle the heat energy of the entering steam is expanded upon itself in producing very high velocities of efflux, in the Parsons arrangement the total velocity, due to expansion, is subdivided into a number of steps, in each of which it is reduced through the dynamic relation of the jet and vane, so that a comparatively low velocity is obtained from inlet to outlet. Steam from the steam-chest enters a set of stationary blades. The steam expands in the moving blades, and there is a reaction effect besides that due to the impulse in the stationary blades. The total torque produced at the shaft is, therefore, due to impulse plus reaction. The Parsons turbine utilizes many sets of stationary and moving blades, and the areas of the passages are increased in volume from

inlet to outlet corresponding with the expansion of the steam. When the heights of the buckets have reached a certain limit, the diameter of the turbine is increased and the steam is permitted a higher velocity that enables the blades to commence another progression.

Although there are many other turbines being developed, yet the types explained above attained the greatest success commercially. In regard to their comparative economy it can be said that for smaller sizes, *i. e.*, up to three hundred horse-power, the De Laval turbine seems to give the best steam consumption. In regard to larger units both the Curtis and Parsons show excellent results, and, in deciding between these turbines, it will depend entirely on the conditions at which the turbines are to be operated. Thus where space is very valuable the Curtis turbine would be preferable. Then the Curtis turbine may give better economy at overloads than the Parsons, but for a steady load, such as a lighting load, the Parsons may be preferable.

In comparing steam-turbines with reciprocating engines the following advantages are claimed for the steam-turbine: (1) Space occupied by steam-turbine is much less than that occupied by a reciprocating engine of the same power. (2) Less weight, the turbine weighing about one-sixth to one-eighth as much as a reciprocating engine of the same power. (3) No vibration. (4) Less noise. (5) Less attendance. (6) Lower maintainance. (7) Lower first cost. (8) The turbine requires no internal lubrication, and thus the exhaust steam may be returned to the boiler without requiring oil filtration. (9) In a reciprocating engine there is a great loss from steam leaking past the slide valve. In the steam-turbine we have no slide valve. (10) The turbine gives more gain from the use of superheated steam and from vacuum than the reciprocating engine.

In regard to economy in the steam consumption, it can be said that the steam-turbine gives as good results as the best reciprocating engines on the market. At light loads and overloads there is no doubt an advantage on the side of the turbine.

In conclusion it can be stated that the steam-turbine has come to stay, and while it may not replace the reciprocating engine for all purposes, it has already shown its superiority over any other prime mover as far as the driving of electrical generators is concerned.

ANDREY A. POTTER.

SUMMER COURSE IN DOMESTIC SCIENCE.

On May 23 will open the second session of the Domestic Science Summer School at this College. The attendance of last year indicated that it met a need, and many letters are being received from those expecting to attend the approaching term.

Only those who are at present teaching, or have taught, will be received. The number must be limited, and as many teachers wish to receive the State certificate in domestic science, to them must be given the first opportunity for this study at the time most favorable for their attendance.

The scope of the work will be the same as that in junior domestic science I, II, and III, sewing I, II, and III, and floriculture of the sophomore year. About eight hours of work will be required each day.

In domestic science the foods will be studied according to chemical composition, their sources, properties, and economic and dietetic value. Many methods of preparation for the simpler foods will be given. Beginning with vegetables and cream soups, the work will progress through the cookery of cereals, fruits, milk compounds, eggs, meats, breads, pastries, cakes, salads, and frozen dishes. A thorough course in fruit preservation will be given, and also a course in the service of course dinners.

Tuition is three dollars and rooms and board can be found near the College at reasonable rates.

HENRIETTA W. CALVIN.

An exceedingly useful bulletin has just been issued by the Agricultural Department of the Kansas Experiment Station. In it Professor TenEyck gives the results of investigations of "The Roots of Plants." The descriptions and discussion are in the clear and comprehensive style for which Professor TenEyck is so well known to readers of the *Kansas Farmer*. Illustrations are made from photographs of roots from which the soil had been carefully washed. One is surprised at the depth and extent of the root systems of such plants as corn and wheat. Study of these will be most useful in determining methods of cultivation. The *Kansas Farmer* will print some of the illustrations and discussions in the near future. But, the farmer who wishes the entire work should send to the Agricultural Experiment Station, Manhattan, Kan., for Bulletin No. 127.—*Kansas Farmer*.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS..... Editor-in-Chief
PROF. J. D. WALTERS..... Local Editor
PROF. J. T. WILLARD..... Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres..... Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres..... Sedan
HON. J. S. MCDOWELL..... Smith Center
HON. E. T. FAIRCHILD..... Ellsworth
HON. A. M. STORY..... Manhattan
HON. GEO. P. GRIFFITH..... Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

The Farmers' Club of the College intends to publish a periodical in the near future.

Reverend Hanson, of the First M. E. Church of Manhattan, attended chapel last Wednesday morning.

A request for "Bulletin No. 105, on Bootleg in Kansas" was received recently by the Experiment Station.

The annual session of the Farmers' National Congress will be held in Richmond, Va., September 12 to 22, 1905.

Student A. H. Spuhler, of the architectural course, has drawn a neat set of plans and elevations for a new residence for Superintendent Edgerton, of the Manhattan city schools.

The game last Saturday, April 29, between the College and Colorado University resulted in a victory for the College. The day was ideal and the crowd was large. The game stood 4 to 1.

President Nichols went to Phillipsburg last week to lecture before the schoolboard on "Manual Training; its Aims, Means and Methods." On Wednesday of this week he went to Topeka to confer with the State printer about the printing of the annual catalogue.

D. Peterson, father of J. B. Peterson, '07, whose farm is located in Sedgwick county, near Wichita, Kan., sent to the College a sample of this year's alfalfa, cut May 1, which measures twenty-eight inches in height. This alfalfa is grown on upland, rather sandy soil. Mr. Peterson reports that he cut five good crops of alfalfa hay from his fields in 1904.

We read from a recent number of the *Daily Havana Post* that President Palma, in his message to the national congress of Cuba, on April 4, bestowed high praise on Doctor Mayo, formerly of this College, now chief of the Department of Animal Industry. He repeated a request, made in his former message, that congress appropriate \$40,000 for the purchase of land for stock-raising experiments.

Secretary Wilson and a number of experts of the Agricultural Department at Washington are to make a trip through a portion of the Southwest this and next week. Meetings are to be held at Little Rock May 12, Oklahoma City May 13, Herington, Kan., May 15, and Norton, Kan., May 16. The object of the trip is primarily to educate the farmers of the Southwest as to improved methods of farming.

All railway associations in the United States and Canada except one have granted the National Educational Association a rate of one fare plus \$2.00 membership for the round trip to Asbury Park, N. J., and Ocean Grove, N. J., for the forty-fourth convention of the National Educational Association, July 5 to 7, 1905. The exception is the Southwestern Excursion Bureau, with which negotiations are pending.

Ex-Regent and Mrs. John E. Hessin and daughters Miss Louise and Irene, of Manhattan, will leave the 16th for New York, and on the 20th they will sail on the "Queen Louise" for Naples. From here they will go through northern Italy, Switzerland, Germany, Scotland, Holland, and Ireland. Leaving Ireland they will sail from Queenstown to Quebec, from Quebec to Montreal, then down the St. Lawrence river enroute for home. They will be gone four months.

The Farm Department of the College has purchased three new teams this spring—two span of horses and one span of mules. Professor TenEyck was assisted in buying the teams by H. J. Barnhouse, of the Manhattan Transfer Company. The span of four-year-old geldings was purchased from S. P. Woods, Wamego, Kan. The other team of horses are sorrel geldings, four and five years old. The four-year-old was purchased from Jno. Doeber, a farmer near Manhattan, and the five-year-old from The Manhattan Transfer Company. The mule team was bought from two farmers near Randolph, Kan., A. E. Axelton and Jno. Hanson. Mr. Homer Boles, of Randolph, aided in selecting the mule team, and according to his judgment the College now owns one of the finest and largest mule teams in Riley county. The cost of the three teams was practically \$1000.

The band concert last Monday night, given by Brown's Military Band, was by far the finest ever given here. The opera-house was crowded. The organization is now at its best and played the program in a manner equaled only by professionals. The program was made up of standard and popular numbers and, judging from the frequent and hearty applause, certainly pleased the large audience. The overture, "Il Guarany," though extremely difficult, is a composition of great beauty and was one of the most ambitious numbers attempted by the band. The medley overture contained many of the popular melodies that are being whistled and sung on the street just now and made a hit. Among the other numbers were the favorite sextet from Lucia, Wedding of the Winds, waltzes, and several lively marches. Mr. Jackson, who is always a favorite with Manhattan audiences, was at his best. He played a concert polka that gave evidence of his skill and technic on the euphonium. His response to an encore was that beautiful selection "Evening Star," Romanza, from Tannhauser. Mrs. Brown's harp solo was one of the most pleasing numbers on the program. The harp is a most fascinating instrument and always pleases. She responded to a hearty encore with a dainty little extract from a fantasie by Schuecker. The soprano

solo by Miss Adele Blachly was throughly appreciated by everyone. She has a fine voice of excellent quality and good compass and never sang better. For her recall she sang "Spring has Come." The program ended with "The Star Spangled Banner." A great deal of credit is due Mr. R. H. Brown, the leader, for his persistent efforts to get results in a short time. It is a fact that is generally overlooked by most people that the personel of the band changes every three months and makes the rendering of a performance like that given last night doubly hard. Mr. Brown is a director of more than ordinary ability. He conducted the entire program from memory, and each section of the band responded readily to his baton.—*Daily Republic*.

ALUMNI AND FORMER STUDENTS.

Maude Hart, '01, is to be addressed R. F. D. No. 3, Coin, Iowa.

C. D. Blachly, '02, has been very ill with mumps at the Parkview Hospital, Manhattan, but is now improving.

Maude, Kate, Fred and Jeanetta Zimmerman, '02, '00, '98, and '91, respectively, will all be at Moray, Kan., for the summer.

The infant child of J. B. S. Norton ['96] died last night of heart failure. The child was about two weeks old. The mother died one week ago to-day.—*Nationalist*.

Harold T. Nielsen, '03, having completed his course for the Master's degree at the Iowa State College, has returned to the Department of Agriculture, Washington, D. C.

Carl Duehn, graduate of K. S. A. C. '04, and Claude Thummel, of this year's class, went to Leavenworth Saturday, where they will take the examination to enter West Point.—*Nationalist*.

C. C. Smith, '94, is reported to have purchased Mrs. Knapp's property, at the west end of Humboldt street. We understand that he has another venture in journalism in contemplation.

Letters from Fred Kimball, '87, of St. Michaels, Alaska, indicate that the winter this year has been the most open for thirty-five years. Strangely enough, this makes traveling there difficult along the coast where there is usually ice. He is hoping that his temporary appointment as United States marshal will be a permanent one.

Professors Merrill and Northrop and Mrs. Cotey, of the A. C. faculty, went to Brigham Friday morning to hold a two days' farmers' institute. The meetings were well attended and great interest manifested. Mrs. Cotey [Dalinda Mason, '81] held separate meetings for the women. Saturday afternoon over a hundred women listened with interest to a talk on "Foods and Diet." The talk was illustrated by charts and bottles showing the composition of common foods and their uses in the body.—*Logan (Utah) Republican*.

C. A. Kimball, '93, and Mrs. Kimball (Matie Toothaker, second year in 1893), of Courtland, were down to attend the wedding of John. M. Kimball, second-year student in 1894, and Anna Day, student in 1904, which took place Saturday, April 29, at the home of the bride's parents, on Deep Creek.

While the young son of L. C. Criner, editor of the *McPherson Opinion*, was playing with a little playmate at the home of the Rev. W. A. Morris, he got hold of a gasoline can and before he could be prevented had drank a quantity of gasoline. Medical aid was summoned at once, but nothing could be done to save him and he died in about two hours.—*Capital*. Mr. Criner is a member of the class of 1892 and will have the sympathy of many friends.

M. A. Carleton, '87, cerealist of the Bureau of Plant Industry and in charge of cereal investigations and vegetable, pathological and physiological investigations, is the author of *Farmers' Bulletin No. 219, "Lessons from the Grain Rust Epidemic of 1904."* Mr. Carleton's large experience in the study of fungi makes him especially competent to write a bulletin of this kind, and the result is an interesting and valuable pamphlet on this subject.

Geo. F. Thompson, M. S., and junior in 1880, is the author of bulletin No. 68 of the Bureau of Animal Industry. This is a handsomely illustrated pamphlet of 87 pages giving "Information Concerning Milch Goats." Mr. Thompson's attractive style of writing adds greatly to the interest of a subject of which the people of this country have little knowledge. Goats are an important source of milk in the Old World, and there are many situations in which they might be advantageously used in this country.

The following notice has been received from R. G. Lawry, '03, and is published with pleasure. The number of graduates and former students living in Chicago and vicinity is probably greater than many suppose. We are glad to notice the disposition of alumni to use the *INDUSTRIALIST* as a means of communication. As time goes on this function of the College paper should become more pronounced.

To Alumni and Former Students of K. S. A. C. in Chicago and Vicinity:

The Alumni and former students of the College in Chicago and the surrounding towns will have a banquet and reunion on May 19. All alumni and former students and their families are expected to attend, also any Manhattan people or friends of the College in Chicago are invited. After the dinner it is the intention to form a permanent organization of the alumni. There will be music, speeches and toasts after the dinner, and renewal of old acquaintances and forming of new ones, it is hoped. The date is Friday, May 19, and the place the Alvord, in the Pullman building, southwest corner Adams street and Michigan avenue, Chicago Ill. Address all inquiries to David G. Robertson, '86, 1108 Association Building, 153 LaSalle street, Chicago. Invitations will be sent later.

VOL. 31

NO. 33

Historical Society

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University)	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg)...	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D. V. M. (Cornell University)...	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, B. S. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.).....	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoemith, B. S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B. A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MAY 13, 1905.

No. 33

THE CONCLUSION OF AN ORATION.

IN No. 12 of the current volume of THE INDUSTRIALIST I discussed the qualities essential to *The Introduction* of an oration. In the present article I wish to consider, as briefly as possible, the composition of *The Conclusion*.

This is at once the easiest and the most difficult part of the entire speech. Rhetorically it is that for which all the rest of the speech is made. So far as the conclusion differs from the other parts of an oration in style, as well as in thought, it may be regarded as the outcome and fruitage of all that has gone before. Various forms of conclusion are possible. Which of these shall be chosen on any particular occasion will depend largely upon the type of the speech as a whole. If the oration be mainly intellectual in its nature—for example, an argument before a bench of judges, or a serious expository address before a lyceum—the conclusion may frequently consist of a *summary* of the arguments presented, with an application of the truth established to a single action or to a course of action.

An illustration of such a summary and application is furnished in the conclusion of Ruskin's lecture on "Conventional Art:"

"Make, then, your choice, boldly and consciously, for one way or another it must be made. On the dark and dangerous side are set the pride which delights in self-contemplation, the indolence which rests in unquestioned forms, the ignorance that despises what is fairest among God's creatures, and the dullness that denies what is marvelous in His working. There is a life of monotony for your own souls, and of misguiding for those of others. And, on the other side, is open to your choice the life of the crowned spirit, moving as a light in creation, discovering always, illuminating always, gaining every hour in strength, yet bowed down every hour into deeper humility; sure of being right in its aim, sure of being irresistible in its progress; happy in what it has securely done, happier in what, day by day, it may securely hope;

happiest at the close of life, when the right hand begins to forget its cunning, to remember that there never was a touch of the chisel or the pencil it wielded but has added to the knowledge and quickened the happiness of mankind."

The conclusion may sometimes consist of the closing argument of the discussion, expanded, intensified and applied as the climax, and crown both in thought and style of the entire discourse. No more effective method than this can be found for the intellectual type of oratory. In this form the speech, as it approaches its conclusion, sweeps onward with constantly accelerated speed and augmented power, gathering weight and momentum as it proceeds, concentrating, as it were, into its closing paragraph all the thought, reasoning and conviction of the whole discourse, thus making of that paragraph the most impressive part of all. Thus it seems to be, indeed, "logic set on fire," blazing and blistering its way through the reason to the wills of men.

This kind of conclusion, while less formal, has also the advantage of being more natural than a recapitulation. It impresses one as the normal outgrowth and climax of the whole discourse.

In the more impassioned types of oratory, the conclusion naturally partakes of the style pertaining to the entire production; except that it is more intense, more elevated, more nearly akin to poetry than the main body of the address. By the time he comes to this part of his discourse, if ever, the speaker has succeeded in bringing his hearers into full sympathy with his own thought and emotion. All their powers are in harmony with him, and, like the chords of the harp, quiver in response to his every touch. Like one of the old minstrels, he plays upon the whole gamut of their souls and brings forth what music he will.

Because he has, presumably, won the interest, understanding and sympathy of his audience, the speaker may appropriately use longer and more complex sentences in the conclusion than would be, ordinarily, advisable in the opening of the speech. His hearers will then have less difficulty in understanding him, because they have the momentum of all that has gone before to carry them triumphantly through.

Naturally, also, this part of the discourse should be more full of force and fire than would be pleasing in the introduction. Here the speaker's aim is to drive home the truth he has been presenting in such a way that his hearers will be moved to adopt that truth

as a motive to action. It is the place for what the older preachers termed the "rousements." Consequently there is room for the loftiest flights of the imagination, for the boldest figures of speech, for the most brilliant illustrations, for the expression of the noblest aspirations, for the most impassioned appeals. Here, if ever, the orator may pull out every stop and pour out the music of his soul without restraint.

EXAMPLES: 1. One of the best illustrations, known to every American schoolboy, of the impassioned conclusion, in the form of aspiration or the expression of a wish, is the magnificent peroration of Webster's "Reply to Hayne." It would be difficult to find, at least outside of pulpit oratory, a more splendid burst of eloquence in any language:

"I have not allowed myself, sir, to look beyond the Union, to see what might be hidden in the dark recess behind. . . . While the Union lasts we have high, exciting, gratifying prospects spread out before us, for us and our children. Beyond that I seek not to penetrate the veil. God grant that, in my day at least, that curtain may not rise! God grant that on my vision never may be opened what lies behind! When my eyes shall be turned to behold for the last time the sun in heaven, may I not see him shining on the broken and dishonored fragments of a once glorious Union; on states dissevered, discordant, belligerent; on a land rent with civil feuds, or drenched, it may be, in fraternal blood! Let their last feeble and lingering glance rather behold the gorgeous ensign of the Republic, now known and honored throughout the earth, still full high advanced, its arms and trophies streaming in their original luster, not a stripe erased or polluted, nor a single star obscured, bearing for its motto no such miserable interrogatory as 'What is all this worth?' nor those other words of delusion and folly, 'Liberty first and Union afterwards;' but everywhere, spread all over in characters of living light, blazing on all its ample folds, as they float over the sea and over the land, and in every wind under the whole heaven, that other sentiment, dear to every true American heart, 'Liberty and Union, now and forever, one and inseparable!'"

2. The following from Sumner's speech on the "Crime Against Kansas" is well worthy of study as an illustration of the impassioned conclusion, which takes the form of appeal:

"The contest, which, beginning in Kansas, has reached us, will

soon be transferred from Congress to a broader stage, where every citizen will be not only spectator, but actor; and to their judgment I confidently appeal. To the People, now on the eve of exercising the electoral franchise, in choosing a chief magistrate of the Republic, I appeal, to vindicate the electoral franchise in Kansas. Let the ballot-box of the Union, with multitudinous might, protect the ballot-box in that territory. Let the voters everywhere, while rejoicing in their own rights, help to guard the equal rights of equal fellow-citizens; that the shrines of popular institutions, now desecrated, may be sanctified anew; that the ballot-box, now plundered, may be restored; and that the cry, 'I am an American citizen,' may not be sent forth in vain against outrage of every kind. In just regard for free labor in that territory, which it is sought to blast by unwelcome association with slave labor; in Christian sympathy with the slave, whom it is proposed to task and sell there; in stern condemnation of the crime which has been consummated on that beautiful soil; in rescue of fellow-citizens now subjugated to a tyrannical usurpation; in dutiful respect to the early fathers whose aspirations are now ignobly thwarted; in the name of the Constitution, which has been outraged, of the laws trampled down, of justice banished, of humanity degraded, of peace destroyed, of freedom crushed to earth; and in the name of the Heavenly Father, whose service is perfect freedom, I make this last appeal."

3. Another splendid illustration of the impassioned conclusion is found in Burke's opening speech at the trial of Warren Hastings. The concluding sentences furnish a fine example of the impassioned climax.

"I impeach Warren Hastings, Esquire, of high crimes and misdemeanors. I impeach him in the name of the Commons of Great Britain, in Parliament assembled, whose parliamentary trust he has betrayed. I impeach him in the name of all the Commons of Great Britain, whose national character he has dishonored. I impeach him in the name of the people of India, whose laws, rights and liberties he has subverted, whose property he has destroyed, whose country he has laid waste and desolate. I impeach him in the name and by virtue of those eternal laws of justice which he has violated. I impeach him in the name of human nature itself, which he has cruelly outraged, injured, and oppressed, in both sexes, in every age, rank, situation and condition of life."

4. A frequent and important type of the impassioned conclusion

takes the form of a prophecy. An illustration of this type is chosen from a speech delivered in the House of Representatives by Frank Hurd, on "A Tariff for Revenue Only:"

"With the opportunity of unrestricted exchange of these products, how limitless the horizon of our possibilities! Let American adventurousness and genius be free upon the high seas, to go wherever they please and bring back whatever they please, and the oceans will swarm with American sails, and the land will laugh with plenty within its borders. The trade of Tyre and Sidon, the far-extending trade of the Venetian republic, the wealth-producing traffic of the Netherlands, will be as dreams in contrast with the stupendous reality which American enterprise will develop in our own generation. Through the humanizing influence of the trade thus encouraged I see nations become the friends of nations and the causes of war disappear. I see the influence of the great republic in the amelioration of the condition of the poor and the oppressed in every land, and in the moderation of the arbitrariness of powers. Upon the wings of trade will be carried the seeds of free government, to be scattered everywhere to grow and ripen into harvests of free peoples in every nation under the sun."

The above examples will serve to illustrate some of the qualities of style that belong to the conclusion in oratory of the noblest type.

CLARK M. BRINK.

DISGUISED COMPOUNDS IN GERMAN.

IN following the history of words one sees many different elements at work. The shortening of words through loss of endings is a factor everywhere present in the development of words in the Indo-germanic languages. For instance, Indo-germanic **dhoghos* becomes Germanic **dagas*, from which evolve Gothic *dags*, Old Norse *dagr*, Old Saxon *dag*, Anglo Saxon *dæg*, Old and New High German *Tag* "day." On the other hand we have the lengthening of words through the addition of prefixes and suffixes. In the latter case we may have instead of a single prefix or suffix two, three, four, or even more. Examples are to be found on every hand. In English the best examples are to be seen in words from the Latin, as *in-con-test-abil-ity*, *in-com-pre-hens-ibil-ity*; German furnishes such examples as *Ver-sicher-ung*, *Be-leid-ig-ung*, *Ver-viel-*

fält-ig-ung. Or the elements combining to form new words may be full words, as Eng. *to-morrow*, *book-case*; Germ. *Lebens-versicherung*, *Majestäts-beleidigung*. It is a special division of the latter class with which this paper has to deal, namely those German compounds the elements of which are no longer distinguished by the casual reader. The compounds which are not readily recognizable as such do not form a very large division in German. For convenience they are simply given in an alphabetical list with no further attempt at classification.

Adler "eagle," Middle High German *Adler adel-ar* from Old High German **adal-aro*¹ is really a compound with the meaning "edler Aar" ("noble eagle") as the O. H. G. and M. H. G. forms show. *Aar* occurs in New High German only in poetry, *Adler* being the prose form.

Beide "both" had in M. H. G. the forms *beide* and *bēde* masc. and fem., *beidiu* neuter, and in O. H. G. the forms *beide* *bēde* masc., *beido* fem., *beidiu* neuter corresponding to Old Frisian *bēde*. Compare with these forms Anglo-Saxon *begen* *bā bū*, Gothic *bai* "both." In Gothic *bai bōs* *ba* was combined with the article, as *ba tho skipa* "both (the) ships." A. S. *bā* was in the same way used with the article *thā*; these became Middle English *bō-the*, which in turn gave rise to N. E. *both*. It will now be clear that O. H. G. *bēde* is compounded from *bē* and *de*, *beidiu* from *bei* and *diu*.

Elend "miserable" from M. H. G. *elilenti* "banished, foreign, dwelling in another country." Old Saxon *eli-lendi* has the same structure and meaning. The first element is seen in Latin *alius* "other," and the second will be recognized in the English form *land*.

Elsass "Alsace" developed from O. H. G. *Elisāss* contains likewise the first element found in *elend*. The root of the second element is seen in Eng. *seat* (cf. *county-seat*). *Elsass* is therefore really "the *seat* on the *other* side of the Rhine." English-French *Alsace* is a development from Middle Latin *Alisātia*, German in origin and an older form of O. H. G. *Elisāss*.

Folgen "follow" has the older forms M. H. G. *volgen*, O. H. G. *folgēn* which correspond to Dutch *volgen*, A. S. *fylgan* *folgian*, N. E. *follow*. This word seems to be a compound of *voll* (Gothic *fulls*) "full" and *gen* (O. H. G. *gēn gān*) "go." With this strange com-

¹ The * denotes a form which does not occur in the literature of a language but has been reconstructed by philologists as the form once in use.

pound compare A. S. *ful-ēode* (*ēode* "he went") "he followed," A. S., Old Low German *ful-gangan* (*gangan* "go"), O. H. G. *fola gan* "to follow."

Heuer "this year, this season," M. H. G. *hiure*, O. H. G. *hiuru* is a development from *hiu jāru* "in this year." The first element is the same as Eng. *he* from A. S. *hē* and occurs further in Lat. *cī-s*, *cī-tra*, in Eng. *here*, etc. The second part is of course the form corresponding to Eng. *year*.

Heute "to-day," M. H. G. *hiute*, O. H. G. *hiutu* is cognate with O. S. *hiudu hiudiga*, O. Fris. *hiudega* "to-day." We must assume as the Gothic form **hijō daga* "on this day" with the accent on the pronoun. In this way the two words fused into O. H. G. *hiutagu*, shortened later to *hiutgu hiuttu*, finally to *hiutu*. So *heute* is really "this day," an expression used in legal documents in English.

A parallel case is O. H. G. *hī-naht*, M. H. G. *hīnet* "this night;" *hīnet* however has not come down into modern German.

Kiefer "pine, fir, *pinus silvestris*" with the byform *kienföhre* is called in Upper German (Oberdeutsch) simply *Föhre* "pine, *pinus silvestris*" and *Kien-baum* "the same." From this it is clear that *Kiefer* originated from *Kienföhre*. *Kimfer* and *Kinfer*, dialect forms, are connecting links between *Kiefer* and *Kienföhre* and have the same meaning.

Messer "knife" is the descendant of M. H. G. *messer messeres* n. "knife." The O. H. G. forms *messiras*, *nessi-rahs*, *mas sahs*, *messi-sahs* correspond to O. S. *Mesas* (a later form of **met-sahs*) and A. S. *mete-seax*. All of these forms contain as the first part Eng. *meat* (A. S. *mete*, O. H. G. *mas*, Gothic *mats*) "food," and as the second O. H. G. *sahs*, A. S. *seahs* (*sea c*) "sword, knife." Of especial interest is the second part of the compound which occurs in *Saxon*, originally "sword-bearer" and in Lat. *saxum* "rock, piece of stone." The identity of O. H. G. *sahs* and Lat. *saxum* lead us back to the Stone Age; each of these words meant originally "stone" and later, in the Germanic dialects at least, the word took on the meaning "stone implement, stone knife." Eng. *steel* shows a similar development.

Naber Näber "auger" have the M. H. G. forms *negber nageber*. These are developments from O. H. G. *nebe-gēr nabe-gēr* and owe the peculiar transformation of the first syllable to the influence of *Nagel* "nail." O. H. G. *nabe-gēr*, older *nabu-gēr* is a parallel to A. S. *nafo-gār*, M. E. *nave-gōr nauger*, N. E. *auger*, O. L. G. *nabu-gēr*,

O. N. *naf-arr*. All these words contain the elements of N. E. *nave* and N. H. G. *Geer* "speer" (compare N. E. *garlic* really "the *spear-like* plant"). That the compound was present in Old Teutonic before the splitting up into dialects occurred is shown by the Finnish borrowing *napa-kaira* "auger." The N. E. form of the word is due to a misunderstanding; a *nauger* became an *auger* just as a *nadder* is to-day called an *adder*.

Neben "beside" goes back to M. H. G. *neben*, shortened byform of *eneben*. These M. H. G. forms have the O. H. G. correspondences *neben* and *ineben*. But O. H. G. *ineben* as a compound of *in* and *eben* means really "on the same line with." In other dialects we observe the same phenomenon: O. S. *an eben*, A. S. *on efn* (*on emn*) the latter form developing into N. E. *anent* with inorganic *t*.

Schulz, *Schulze* "village-mayor" is the development of M. H. G. *schuld-heize* from O. H. G. *sculd-heizo* the byform of which, *sculd-heiso*, develops regularly into M. H. G. *schuldheise*, N. H. G. *Schultheiss* "village-mayor." To the full form *Schultheiss* correspond A. S. *sculd-hæta* *scyld-hæta*, Frisian *skeldata* *skelta*, Dutch *schout* (from *schold-hete*), L. Germ. *schulte* (from *schuid-hete*). The two parts of the compound are M. H. G. *schult* "obligation" and N. H. G. *heissen* "to order, command." The *Schultheiss* was originally "he who enforces obligations," hence "judge," later "mayor." The family name *Schulz*, *Schulze*, also spelled *Scholz* is found most frequently in the Franconian dialect; the Low German form of the same is *Schulte*.

Schuster "shoemaker" is a contraction of M. H. G. *schuoh-sūttere*. The first part of the compound is Germ. *Schuh*, Eng. *shoe* and the second part Lat. *sūtor* (whence also A. S. *sūtēre*, Scotch *souter*) "shoemaker." An analogical case of reduplication of meaning is seen in Eng. *chinch-bug* the first part of which is Span. *chinha* "bug."

Sperber "sparrow-hawk" is derived from M. H. G. *sperwære* *sparwære* and these are the descendants of O. H. G. *sparwāri*. This *sparwāri* is really "eagle which lives on sparrows" for the first element is that seen in Eng. *sparrow* and the second is N. H. G. *Aar* "eagle" (see *Adler* above). This compound was borrowed by several of the romance languages, appearing for instance in Ital. *sparaviere* and in French *epervier*.

Welt "world" has the M. H. G. forms *welt*, *werlt*, *werelt* and O. H. G. forms *weralt* and *worolt*. In addition to the signification

"world" the M. H. G. and O. H. G. words have also the older meaning "an age." O. S. *werold* has only the meaning "earthly existence, age." On the other hand Dutch *wereld* and A. S. *weorold worold*, Eng. *world* have only the secondary meaning. The compound seems to be a translation of Christian-latin *saeculum* "world" for Classic-latin *saeculum* "an age." The first element is the same as in Latin *vir* "man" and the second has the root found in Eng. *old*. *Welt* accordingly would be "das Menschenalter, age of man." By some *world*, *Welt* is thought to be really the "old man," an idea quite parallel to the supposition that A. S. *gar-secg* "ocean" is really "spear-man."

Wimpel "pennant" is from M. H. G. *wimpel* "banner, streamer, kerchief" and this from O. H. G. *wimpal* "kerchief, veil." Corresponding words in other dialects are Dutch *wimpel*, A. S. *wimpel*, *winpel*, Eng. *wimple*. If this were a native word, the High German would have a form with *mf* but since both L. G. and H. G. dialects have the spelling with *mp* the word is thought to be a compound probably made up of *wind* and A. S. *pæl* from Lat. *pallium* "covering, curtain." Through the A. S. missionaries the word could have spread to the mainland. From the German dialects the word was taken over by the French where it has the form *guimpe* (Old French also *guimpe*) "veil, kerchief, banneret."

Wimper, M. H. G. *wint-brā wint-brāwa*, O. H. G. *wint-brāwa* "eyelash" is made up of two elements as is plainly seen by comparing the O. H. G. form with Eng. *brow*. The first part occurs in N. H. G. *winden* "to wind," the second in *Braue* "brow." The first meaning of the compound must have been "the winding brow."

Wurzel "root" is derived from M. H. G. *wurzel* and this from O. H. G. *wurzala*. *Wurzala* corresponds to A. S. *wyrt-walu*; in this O. H. G. form the *w* in the interior of the word has dropped out as has happened also in *Römer* "Romans" (A. S. *Rōmware*), *Bürger* (A. S. *burgware*) "inhabitant of a city." The first part of this reconstructed O. H. G. **wurz-wala* is Eng. *wort* "plant," the second is Gothic *walus* "staff," A. S. *walu*, "weal, knot." The original meaning of A. S. *wyrt-walu*, O. H. G. *wurzala* was "stem of a plant," the meaning "root" being a later development.

The above list is by no means exhaustive. It shows many of those disguised compounds both of whose elements have been discovered. There is another class of disguised compounds which deserves being mentioned here. This includes such words as

Epheu "ivy," *Hexe* "witch," words of which only one element has been recognized as yet. A third list, old compounds neither element of which has yet been identified, would doubtless run into the hundreds, and a very large percentage of these words never can be analysed. I hope, however, that the analysis given above has put before the reader in tangible form one of the important factors in language development.

J. V. CORTELYOU.

Seven seniors of the mechanical engineering course and five juniors of the course in architecture, accompanied by Professors McCormick and Walters, were in Kansas City on Tuesday and Wednesday to make professional observations. The architects visited the Great Western Sash and Door mill, the Prest Furnace Foundry, the Pittsburgh Plate-Glass warehouse, several establishments devoted to the manufacture of artistic glass goods, cement articles, and fire-places, the Government building, the Convention Hall, the Fidelity Trust vaults, several of the leading architects, and many other places of interest to students of the art of building, while the mechanics gave their time to a study of the large power plants of pumping stations, packing-houses, and the street railway companies. All report a very profitable time and regret that the visit in the great metropolis of the plains was so brief. Wherever the visiting parties appeared they were well received. The Kansas City business men were delighted to explain their methods and means and to give the visitors their catalogues and hand-books.

The Topeka *Journal*. "One of the best concerts of the season was given at the high school auditorium on Friday night under the auspices of the Swedish-American National League. About five hundred people were in the audience. This was the first of a series of concerts which will be given. It is the plan of the league to keep up the musical events and use the money for charitable purposes. The annual June festival of the league will be held in Topeka on the 25th. The affair promises to be an extensive one and arrangements are being made to entertain one thousand delegates. Concerts will be given while that gathering is here. The singing of Olof Valley was the feature of the program last night. He is professor of vocal music at Manhattan Agricultural College and has a national reputation as a baritone singer. His voice has range, depth, and quality, and also feeling. His best numbers were 'The Bandelero,' 'Harbor Bar,' and 'Absent,' but his Swedish songs were most popular with the audience."

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College. Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres.....Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres.....Sedan
HON. J. S. MCDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

As we are going to press, Saturday afternoon, the baseball team of Washburn College is measuring itself at the Manhattan arena with the nine of the K. S. A. C.

Prof. W. A. McKeever went to Valley Falls last Friday evening to give the commencement address. The professor graduated from the high school of that city seventeen years ago.

The Emporia baseball team was vanquished last Thursday in the Manhattan arena by the K. S. A. C. boys. The Normalites played well, but lost 5 to 2. "It was a famous victory."

President Nichols has invited Secretary Wilson of the Agricultural Department, Washington, D. C., to stop off at the College on Monday or Tuesday on his trip to Norton, Kan., where he is billed for an address.

The commencement exercises of the Manhattan high school will be held at the Congregational church, May 17 at 8:15 P. M. Rev. O. B. Thurston will preach the class sermon at the same place on May 14, at 8 P. M. The class numbers twenty-seven pupils.

The Physics Department picnic expedition to Eureka Lake last Monday was a success, notwithstanding the threatening weather. There was lots of fun and plenty of fish, and the students, in appreciation of the treat, presented Professor Eyer with a fine fishing outfit. The party was accompanied by President and Mrs. Nichols.

The Woman's Christian Temperance Union of Riley county has presented the College with a beautiful framed picture of Frances E. Willard, and the following books: Glimpses of Fifty Years, How to Win, A Wheel Within a Wheel, Woman and Temperance, Woman in the Pulpit, A Great Mother, A Classic Town, Nineteen Beautiful Years, A Young Woman Journalist, by Frances E. Willard; Our Country, by Josiah Strong; Sweet Cicely, by Marietta Holley. The picture will be given a place in the College Library.

The field-day exercises will take place in the city park Monday afternoon. Each of the four classes will have two contestants in each exercise. The following is the order of events: 100-yard dash, 220-yard dash, 440-yard dash, $\frac{1}{2}$ -mile run, 1-mile run, 2-mile run, 16-pound hammer throw, 16-pound shot put, discus throw, running high jump, running broad jump, pole vault, 220-yard low hurdle race, 120-yard high hurdle race. The winners of first and second places in each contest will represent the College in the meet against Emporia, which will be held in the city park, May 22.

About one hundred fifty members of the two classes were present Monday night at the senior-junior reception given in Kedzie Hall. The rooms were decorated in old rose and white, the senior colors. During the first part of the evening the time was spent in making May-baskets and voting on the prettiest girl. The girl receiving the highest number of votes was to be the May queen. Miss Jessie Sweet, of the senior class, and Miss Daisy Harner, of the juniors, were the lucky ones. The queens then distributed presents to each guest, in the way of horns, tops, whips, dolls, etc. This amusement was followed by a dainty two-course luncheon, which was served by the first-year girls. At the close there were the usual toasts and roasts given by F. W. Campbell and James Cheney of the junior class, and Ray Carle and Mr. Ballard of the seniors. Miss Blanche Stevens then presented the old, historical shepherds' crook to the junior class, which was appropriately received by Miss Marcia Turner.—*Daily Republic*.

Nearly a thousand visitors thronged the halls, class rooms and campus of the College all day last Friday. The visiting party, twelve car-loads of them, came here over the Rock Island road from Norton, Jewell, Smith and Phillips counties, redeeming a promise made President Nichols some time ago by Superintendents Durham and Wriste, that some day they would bring us the largest educational excursion ever brought to the College. The trains pulled into the Manhattan depot about 9 o'clock A. M., and the visitors, young and old, came at once to the "City on the Hill" to see us at work. The forenoon was spent in the class rooms, laboratories, shops, and barns. In the afternoon they saw the cadet drill on the campus, the girls' drill in the Gymnasium, and attended the recital given in the Auditorium by the classes in music. All expressed themselves greatly pleased by the work and condition of the College and the hearty reception given them, and departed in the evening feeling that they had had a profitable and happy day. Among the visitors we noted many former students. Regent McDowell, of the College, was also of the party, acting as the pilot of the Smith county people. Come again, ladies and gentlemen, "The latch string hangs out."

ALUMNI AND FORMER STUDENTS.

W. L. Harvey, '02, is located at Wamego with the law firm of Coddington and Keyser.

W. A. and F. C. Webb, '04, have changed their address from Peck to Clearwater, Kan.

C. A. Kimball, '93, and Matie (Toothaker) Kimball were among those in the excursion from Jewell, Republican and Smith counties this week.

Ivy Harner, '93, has returned from her European trip and has been visiting Mrs. Kedzie Jones, '76, at Kalamazoo, Mich., and Mrs. Maud (Gardiner) Obrecht, '93, at Champaign, Ill. She is expected home at Manhattan early next week.

W. E. Miller, editor and proprietor of the *St. Mary's Star*, former student and one of the old stand-bys in the Printing Department, was here Wednesday. Like the rest of us, he has found that much must be learned after leaving College.

Eva Rigg, '02, is attending the Fisk Training School in Kansas City, Mo., and at the same time assisting in the instruction. She is in charge of the work in cooking and finds it very interesting. The school hopes to retain her for next year also, and Miss Rigg will probably remain.

The last number of the *Jayhawker* was one of the best yet, its principal articles being furnished by alumni. J. B. Brown, '87, gave some characteristic "Reminiscences;" P. McD. Biddison gave a graphic description of "The Zeigler Mine Explosion;" C. G. Elling, '04, was the author of the "Prize Letter" which won the ten dollar award in the recent alumni contest, and Wilma (Cross) Rhodes, '04, furnished chapter three of "A Dakota Romance," and Thos. Bassler, '85, had a very interesting letter with notes on a number of old students and graduates. From the "Alumni Notes" the following items are extracted:

Barton R. Thompson, '00, is foreman of the Hillside Dairy Farm, Birmingham, Ala.

Emma Glossop, '83, is a journalist in St. Joseph, Mo. Her address is 1326 Frances street.

W. D. Davis, '04, electrician with the Western States Portland Cement Company, is located at Independence, Kan.

News comes of the death of H. B. Kempton, senior in '99-'00, who died recently of typhoid fever at his home in Raritan, N. J.

Prof. E. H. Webster, '96, and Mrs. Florence (Fryhofer) Webster, '95, are pleasantly situated at the "Columbia." Professor Webster is frequently absent from the city in the dairy interest.

J. J. Johnson, '95, is at present a Pullman-car conductor, with headquarters at Lichfield, Ill. He expects soon to return to the practice of medicine and will locate somewhere in Idaho or Washington.

W. L. Hall, '98, formerly chief of the Division of Forest Extension, is now chief of the office of Forest Products. His work includes the testing of strength of timbers, and treating them with preservatives to prolong their life.

Ernest P. Smith, '95, and Mabel (Cotton) Smith, '96, have moved from Globe, Ariz., to Fort Collins, Colo., where Mr. Smith expects to go into the poultry business on an extensive scale. They are delighted with Fort Collins and expect to make it their permanent home.

Word has recently been received of the marriage of Susan W. Nichols, '89, and Walter L. Eshelman, both of St. Joseph, Mo. Our invitation to the wedding somehow failed to reach us, and we are unable to give exact date of the event. Their address is 926 Felix street.

The Printing Department of the Kansas State Agricultural College has recently received a number of applications for printers, mostly for foremen in newspaper offices. Competent all-around men seem to be scarce. The applications are not from Kansas newspaper men alone, but some have come from other states.

The relatively dry spring has not been favorable for the early, rapid growth of grasses, but in the variety plots near the Kansas State Agricultural College buildings certain grasses have made remarkable growth, *Bromus inermis* stands from ten to twelve inches high, May 5, and English blue-grass has made a good growth. Alfalfa is looking well, and clover has made a growth of several inches in height. The *Bromus inermis* on these plots would have made good pasture a month ago.

The Farm Department of the Kansas State Agricultural College, finished planting corn May 5, having planted about eighty acres. Ten varieties of selected corn have been planted in separate fields, with the purpose of breeding and selecting seed. About eighty different varieties have been planted in the regular variety trial. Experiments have also been undertaken with different methods and different thicknesses of planting corn, and with different methods of cultivation. The season has been very favorable for corn planting.

A most conclusive experiment was carried on by the Dairy and Animal Husbandry Department of the Kansas State Agricultural College showing the value of making a balance of feeds containing the carbonaceous and nitrogenous nutrients. Two lots of twelve pigs each were fed for 37 days. Lot I was fed five parts of corn-meal and one part of tankage; Lot II was fed corn-meal only. The average weight of each animal at the beginning was 168 pounds; at the end of that time the average weight of Lot I was 209.5 pounds and of Lot II, 194 pounds, making a total gain of 500 pounds for Lot I and 310 pounds for Lot II, or the former 61 per cent more than the latter. The cost of feed consumed during the experiment was also noted. The following shows amount and value of feed given:

	Pounds Fed.	Value of Feed.		Cost of 100 Pounds Gain.
		Per Ton.	Consumed.	
Lot I. Cornmeal.....	1799	\$12.50	\$11.24	\$3.32
Tankage.....	326	33.00	5.35	
			\$16.59	
Lot II. Cornmeal.....	2.226	12.50	14.10	4.55

The cost of feed for Lot I was more than for Lot II, yet it yielded greater gain. The feed consumed for 100 pounds gain for Lot I was 425 pounds, and for lot II was 726 pounds.

While the ration is not exactly a balanced ration, it proves the value of feeding animals with feeds that contain an approximation of the required nutrients. A ration may vary considerably, but the matter of feeding some nitrogenous feeds must not be ignored in order to make the best gains, even though they are more expensive in point of cost.

Historical Society

VOL. 31

NO. 34

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, • PRES. E. R. NICHOLS
Local Editor, • PROF. J. D. WALTERS
Alumni Editor, • PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....President
JOHN D. WALTERS, M.S. (K. S. A. C.).....Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.)....Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M.S. (K. S. A. C.).....Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph. D. (Univ. of City of New York)...Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K. S. A. C.).....Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph. D. (Heidelberg)..Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....
Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....Secretary
JACOB LUND, M.S. (K. S. A. C.).....Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.), Assistant Professor of English
CLARENCE L. BARNES, D.V.M. (Cornell University)... Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.) Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)... Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.) Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....Instructor in Chemistry
William L. House.....Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.)... Assistant in Music
William Anderson, B.S. (K. S. A. C.).....Assistant in Physics
Miss Gertrude Barnes.....Assistant Librarian
Louis Wabnitz.....Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....Assistant in Drawing
Vernon M. Shoemith, B.S. (Mich. Agr. Coll.)Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.)Assistant in Entomology
Miss Emma J. Short.....Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H. C. A. & M. A.).....Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....Assistant in Zoölogy
Miss Kate Tinkey.....Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....Assistant in Horticulture
Miss Daisy Zeininger, B. A. (Fairmount).....Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....Foreman of Greenhouses
Fred C. Nicholson.....Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....Assistant in Music
Charles W. Melick, B.S. (Neb.).....Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....Assistant in Preparatory Department
Miss Alice M. Melton, B.S. (K. S. A. C.).....Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....Clerk in Botanical Department
Charles Hughes.....Secretary to the President
William R. Lewis.....Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MAY 20, 1905.

No. 34

REPORT OF THE GOVERNMENT SLAUGHTERING DEMONSTRATIONS AND COLD STORAGE MEAT EXHIBIT AT THE LOUISIANA PURCHASE EXPOSITION.

AMONG the numerous exhibits at the Louisiana Purchase Exposition some practical results were obtained from the Government slaughter-house construction, slaughtering demonstration and cold storage exhibit of meat which may be of interest to those engaged in the production of meats. This exhibit was located in the Live Stock Congress Hall and operated under the auspices of the Society of American Agricultural Colleges and Experiment Stations. The object of this exhibit was to compare animals and meat from animals fed on different rations, and to demonstrate to visitors of the exposition the important point of good cattle, sheep and hogs that were slaughtered. The animals were judged in the arena, then slaughtered; the carcasses were then judged and weighed and the meat was cooked, after which it was submitted to judges for their decision. This was considered one of the most efficient means for educating the public in these particular lines that the Government has ever undertaken.

The plant consisted of a slaughtering room, a cooking room and two cooling rooms (one cutting and one chilling). The plant was equipped with the latest machinery that could be secured for that purpose. The slaughtering apparatus, such as trackage, roller scales, cooking utensils, etc., was furnished by the Brecht Butchers' Supply Company, of St. Louis, Mo. The refrigerators were cooled by a ten-ton refrigerating machine, installed by the Larsen Ice Machine Company of Omaha, Neb. The coolers were cooled by direct expansion, one of them having an overhead pipe system, the other a side wall system. The two rooms were so built for the purpose of testing the efficiency of locating refrigerating pipes for cooling rooms. The test proved that for long, narrow and high cooling rooms the later system seemed to give better satisfaction than the overhead, but for low, wide rooms the overhead system seemed to prove the best.

The refrigerators were insulated with Sawyer's rock cotton block insulating material, furnished by the American Insulating Material Manufacturing Company, of St. Louis, Mo. The insulation consisted of a two-inch rock cotton block, protected on each side by two layers of Alaska brand insulating paper, with one dead-air space on each side. Thorough tests were made with this plant to determine the efficiency of this material. The conditions of the test were unusually severe, owing to the character of the building, proving thoroughly the merits of this particular insulation. The temperature of the outside averaged about 80° F., and on the inside 32° F., resulting in a rise of 4° temperature during a period of fourteen hours when the refrigerating machine was not in operation, and no frost on pipe to give continued cooling. Laboratory tests were made of the same material in the following manner: Two square receivers of very thin copper tin of a known conductivity were used; the space between the two receivers was regulated according to the thickness of the insulation being tested. Where the space was one inch in width the inner receiver had exactly twelve square feet of radiating surface. The insulating material was placed between two receivers and the inner receiver was filled with water. In this water was placed a piece of ice which was held at the bottom of the receiver by means of a weight, in order to produce a uniform temperature throughout the whole mass of water. This seemed to be a very important point in making a test of this nature. If the ice is permitted to float, the coldest water will be on top. Since water at 39° F. has a greater density than water at 32° F., the colder water will naturally rise; therefore a piece of the ice placed at the bottom of the testing box induces a current in the water, the colder having a tendency to rise and the warmer to fall, providing it does not exceed 39° F. These receivers, charged with ice and insulating material, were placed in a constant temperature room, and when the whole mass had attained the proper temperature the ice was weighed. After a period of recorded time the ice was reweighed, and from this difference of ice melted the number of heat units conducted through insulated walls was determined. The average results obtained from six determinations of a one-inch block with a constant temperature of 60° outside and 32° inside was 8.8 heat units per square foot per hour, and 4.5 heat units per square foot per hour for two-inch block.

The results were very interesting from the butcher's standpoint, as the ripening of meat in cold storage is one of the most important factors at the present time in slaughtering operations.

REPORT ON CARCASS AND COOKING DEMONSTRATION.

This work was of extreme interest from the farmer's standpoint, and we are indebted to Mr. D. A. Gaumitz, instructor in animal slaughtering at the University of Minnesota, for the accurate work done by him during this test. Three classes of animals were slaughtered—cattle, sheep, and swine—under the following conditions and with accompanied results:

BEEF.

Four classes of steers were slaughtered for a comparison of carcasses, representing the following grades: (1) the over-fat class, (2) the prime class, (3) the under-fat class, and (4) the common or range class. The steers were furnished by agricultural colleges. Kansas supplied twelve steers, Minnesota two, Illinois two, and Iowa one. They were fasted twenty-four hours before slaughtering. After slaughtering they remained in the refrigerator for five days, at the end of which time the carcasses were cut up. The weights and shrinkages recorded during that time appear in the following report.

The open or left-hand side of the carcass was cut into joints as indicated below, and carefully weighed to obtain the relative percentages that each part bore to the cold carcass, so that a comparison could be made between the live steers and their carcasses. For the cooking test with the over-fat, prime, and slightly under-fat steers, the sixth and seventh ribs were taken, and in the common range steer the sixth, seventh and eighth ribs. These were cut alike, except that the common steer carcass was so much lighter than the others that an extra rib was included to make the cuts comparable in weight. The results of this work are shown in the following tabulated report.

PER CENT OF CARCASS TO JOINTS OF GROSS MEAT.

Steers.	Over fat steers.	Prime fat steers.	Slightly under fat steers.	Common or range steers
Round.....	19.48	21.85	21.35	25.61
Loin.....	18.95	17.44	19.60	15.88
Prime rib.....	9.92	9.60	9.45	8.75
Kid, suet.....	2.06	3.09	2.56	1.31
Flank.....	6.43	4.85	3.22	4.26
Sq. chunk.....	21.45	21.09	20.46	25.12
Cross rib.....	3.75	5.58	4.78	3.27
Plate.....	16.26	14.85	14.57	12.49
Shank.....	2.06	2.47	2.89	3.27

SLAUGHTERING, SHRINKAGE, AND YIELD RECORDS.

	Over fat steers.	Prime steers.	Slightly under fat steers.	Common or range steers
Live weight....	1700.00	1526.00	1360.00	2060.00
Warm weight of carcass.....	1131.00	936.00	888.00	613.50
Per cent shrinkage of carcass....	1.94	1.60	.50	2.20
Yield of carcass.....	65.23	60.22	64.02	56.60
Yield int. fat lbs.....	61.00	74.50	57.60	18.50
Percentage of inter. fat to carcass	5.50	8.10	6.50	3.00
Cold weight of carcass.....	1109.00	919.00	883.50	600.00

Comparison of the slaughter records show, first, that the over-fat and prime carcasses were exceedingly heavy and rather fat, and it is natural that the results would show a heavy yield of dressed carcass from each of them. The over-fat steer yielded 65.23 per cent of carcass to live weight. The results show that only a moderate amount of fat was deposited upon his internal organs (61 pounds), and the rest was laid over the carcass. The prime steer dressed out 60.22 per cent of carcass to live weight. It will be noticed that 74.5 pounds of tallow was deposited internally, and as his carcass was not so fat as that of the over-fat steers, they would necessarily dress out a smaller percentage to carcass to live weight. In the case of the slightly under-fat steers, which dressed 64.02 per cent of carcass, the yield, strictly speaking, is not a fair one, and it is not due to superior fleshing or fattening, but rather to the fact that these paunches contained less material than those of other steers. The common or range steers dressed about the normal percentage for those fattened only to the degree that their class represents.

The shrinkage in weight of the dressed carcass usually varies from 1 to 2½ per cent of the warm carcass. A watery carcass usually shrinks most heavily. Such was the case with the common or range steers but the slightly under-fat steers did not, for some unexplained reason, shrink as much as might naturally be expected.

The results of the comparison of cuts of meat will need numerous explanations. The comparison might better have been made had the carcasses been divided into the retail cuts of beef. The cuts made and listed above may be described as follows:

The round includes the rump, round steak, pot roast below the buttock, and the hind shank. The round was separated from the loin by cutting through the joint of the femoral bone and the pelvic arch.

The loin included the portion of the carcass between the round

and the twelfth rib, after removing the kidney fat and the flank. The prime rib included the portion extending from the sixth to the thirteenth rib, or seven prime ribs, cut the normal length, which is about 12 to 13 inches from the spinal cord to the outer end at the posterior portion of the rib. The square chuck includes the five chuck ribs, the shoulder, and the neck. The shank was cut off at the elbow joint. The plate included the regular cut, and in addition the portion of the brisket between the shanks.

The cross rib is the piece between the shank and the square chuck. It was about six inches wide in these specimens.

The slightly under-fat steers were particularly strong and heavy in the loin, as shown by the table, without the superfluous fat found on the others (which would need to be removed before the meat was served on the table). It is evident that the under-fat steers furnished quite the superior carcass of the list of stock in the trial—not only in the loins but in the prime ribs, which cuts constitute the most valuable portion of the carcass.

The over-fat steer was light in his round, which can be seen by examining the cutting record. The common steers seem to have been less strong in the round cut of beef. This high percentage is probably due to the fact that the leg muscles of a western steers are hard and well developed. They are nearly as heavy when lean as when fat; therefore, to get a heavy percentage it is necessary to expand and fill the muscle in that part to make it heavy, and this is especially true when the entire carcass is lean and light in weight while these parts or cuts are heavy. This will also be noticed by comparing the shank, cross-ribs, and the square chuck of the common steer with the percentages of similar cuts from the other steers in the trial.

The percentage of flank and plate cuts in the over-fat steer were high, and he was followed close in these points by the prime steer. This is usually the case with cattle which are very fat. There is a thickening of the parts represented by these cuts, and the fat seems to gather excessively in these regions. By reason of the above fat, it is common for stockmen to examine these parts in live animals to determine their degree of fatness.

The square chuck and cross-ribs cut out heavily in the common steer, as the audience has been lead to expect from the demonstration upon cattle when they were living, at which time attention was called to the fact that he was unusually heavy in the region of

the shoulder and upper arm. The other steers resembled each other in this respect, and it is not a surprise to those who examined them closely while on foot to find the percentages very much alike.

The kidney fat, contrary to the expectations of many stockmen who examined them on floor, was proportionately lighter in the over-fat steer than in the prime, and also lighter than in the under-fat steers. This may possibly be explained by the fact that this steer seems to have laid his fat on the body rather than internally, in further evidence of which the results show that the internal fat run light in this beast. The common steers were naturally rather square in this respect.

It was generally concluded that the slightly under-fat steers were the most economical, or cut up to the most advantage. It was not generally believed, however, by those who examined the carcasses that in the quality of the meat of these steers would be placed first, as the marbling was not as good as in either the over-fat or the prime steers.

A cooking test was made to clear up this point. A special committee of three, in addition to the audience, was permitted to pass judgment upon it by testing small warm pieces with bread as sandwiches. The judgment of the committee, and also that of the majority of the audience, was that the slightly under-fat steers ranked first; that from the prime steers, second; that from the common steers, third; and that from the over-fat steer, fourth. One member of the committee, who is used to testing fine, rich meats, was strongly in favor of the beef from the prime steer, but generally such a rich flavor was not considered so favorably—as shown by their report. The flesh from the over-fat steer had a stringiness, peculiar to over-fatted beef, which does not please the meat-eating public. The flesh of the over-fat steer was extremely rich, but the flavor and texture of it were undesirable. The flesh of the common steers were very tender, reasonably juicy and fairly well flavored, but not rich. This meat was given preference over the richer (somewhat tougher) meat from the over-fat steer. The meat was not so nice as it would have been had rich pieces been used, as fat was lacking in the carcass of the common steer and the meat was a little watery.

The following tables shows two different methods of cutting

rounds and loins. The two hind quarters of a carcass were used in making this comparison:

	Butcher cut.	Regular cut.
Total weight.....	125½ pounds	127½ pounds
Weight of loin.....	55½ "	48½ "
Weight of round.....	70 "	79 "
Per cent of hind quarters:		
To round.....	55.77	61.96
To loin.....	44.23	38.04

The regular cut shows a loss of 6.19 per cent of loin over that secured by the butcher's method.

In a 200-pounds hind quarter or a 400-pounds hind carcass, 6.19 per cent or 24.76 pounds may be thrown into the loin or round, and when the round sells at 6 cents and the loin at 18 cents represents a difference in money value of \$1.48 which can be made by the manipulator.

SHEEP DEMONSTRATION.

Lambs were selected to show the classes known as good, fair, inferior, and very inferior upon the market to enable us to bring out the difference in the products and to prove the correctness of placing.

The following are the slaughter records:

	Pelt.....	Head.....	Paunch empty....	Paunch contents..	Intestines contents.	Tongue.....	Pluck. . .	Live animal....	Dressed carcass..
Good	12.35	4.25	6.25	3.25	5.00	.50	3.00	95	56.5
Fair	14.50	4.00	.....	3.25	4.75	.50	1.75	100	54.0
Inferior.....	18.00	3.00	6.75	4.00	6.00	.50	2.75	60	29.0
Very inferior.	7.75	3.00	5.25	2.75	4.60	.50	1.25	44	17.5

BLOCK RECORDS.

Percentages of gross cuts to the live weight of:

	Hind leg and loin.	Back.	Kidney fat.	Plate & flank.	Front Leg.	Shoulder	Neck
Good	24.52	8.00	2.31	6.94	2.21	10.75	2.10
Fair.....	21.80	7.00	1.50	7.00	2.50	9.60	2.10
Inferior.....	21.00	6.33	.83	5.50	2.83	8.66	2.33
Very inferior.	16.30	5.45	.45	4.64	2.50	7.27	2.27

EXPLANATION OF BLOCK RECORDS OF SHEEP.

First of all it might be well to explain just what the various points or cuts mean. The flank and plate is all that portion of the carcass below the line drawn nearly parallel with the back, cutting from the stifle bone to the tip of the last rib and about two inches below the first rib, or where the front leg is fastened to the body. The neck

is cut off immediately in front of the shoulder. The shoulder is that portion between the neck and fourth rib. The rack is the portion between the fourth and last ribs; and the leg and loin the remainder of the carcass.

The leg, loin and rack are the most valuable joints of the mutton. In this report it will readily be seen that the arrangement of the carcasses in the above order is correct. In the cheap parts, such as neck and front legs, the inferior carcasses cut higher than did the better carcasses.

SWINE DEMONSTRATION.

For this work four grades of butchers' class of hogs were selected by a St. Louis live stock commission company. The live weight will immediately show that Nos. 1 and 3 were too heavy for the butcher hogs. However, they were made to serve the purpose of demonstrating the classes of hogs and of showing the results of the carcass trial.

Hog No. 1 was very smooth, except that the fat was laid on a trifle thick over the top of the shoulder. No. 2 was slightly under finished for the market, which is well brought out by the cooking test. Its head and feet were somewhat coarse and the hams were inclined to be light. No. 3 was over fat and rough. He proved an excellent specimen by bringing out the great loss from trimming and the excessive loss of oil in cooking. It also proved a good example of the coarse-grained meat which is usually found where coarse bones and rough external appearances are seen. No. 4 was a lean, coarse pig, as can be readily seen from the results of the cooking trial. He was coarse and not fat enough; the cooking test clearly confirmed the latter judgment passed upon the appearance of the live animal.

The records are as follows:

SLAUGHTER RECORDS.*

	No. 1.	No. 2.	No. 3.	No. 4.
Contents of stomach.....	1.30	.49	.75	3.16
Stomach empty.....	.92	.73	.83	1.57
Intestines and contents.....	7.83	5.63	5.16	9.42
Liver.....	1.30	1.47	1.41	2.36
Tongue.....	.28	.36	.33	.39
Pluck.....	1.48	1.59	1.16	1.97
Stomach fat.....	.45	.61	.40	.39
Intestinal fat.....	.83	.49	.50	.39
Live weight.....	268.00	204.00	300.00	190.00
Dressed weight.....	209.90	163.50	258.50	147.50
Yield.....	78.31	80.00	86.00	77.63
Cooking record of ribs.....	90.90	86.26	80.00	84.61

*The results are expressed in the percentage of the live weights.

BLOCK RECORD.
Per cent of gross meat to dressed weight.

	No. 1.	No. 2.	No. 3.	No. 4.
Head:				
Cheek meat.....	2.54	3.32	3.33	2.91
Refuse.....	4.81	6.02	4.34	8.05
Shoulder:				
Butt (lean).....	4.23	3.49	3.56	3.47
Butt (fat).....	3.39	2.89	2.86	1.66
Neck, spare-rib.....	1.60	1.32	1.39	2.22
Kegs.....	1.32	1.81	1.16	2.06
Cal. ham.....	11.30	12.40	11.62	15.00
Trimmings.....	2.50	3.13	4.10	3.58
Middle:				
Kidney fat.....	4.81	3.85	5.11	2.77
Loin.....	11.18	18.41	8.21	12.50
Fat back.....	9.71	9.03	10.77	4.58
Spare-rib.....	1.32	1.81	1.16	2.00
Prime bacon.....	15.65	16.50	16.43	11.93
Bacon trimmings..	1.60	.84	4.49	3.88
Ham:				
Prime ham.....	15.84	15.16	16.27	18.05
Trimmings.....	3.00	3.04	4.87	1.65
Leg.....	1.68	1.80	1.55	2.50

For convenience in studying them, the cuts are grouped under head, shoulder, middle, and hams. Under head we have cheek meat and refuse. The cheek most always includes all fat and lean that could be cut from the head. The refuse is the bone and skin remaining. Under shoulder we find that portion of the carcass cut between the atlas joint in the neck and the fifth rib. The neck and spare-rib includes the four ribs and the vertebræ found in the shoulder. The shoulder butt is the top portion of the shoulder, the butt being a continuation of the heavy muscle of the loin. The California ham is that portion of the shoulder lying between the butt and the leg. The leg and trimmings are self explanatory.

Under the middle is found that portion lying between the fourth rib and the point from which the pelvic bones divide at the vertebræ. The kidney fat lies within the carcass and extends from the diaphragm to the hams. The loin is the thick-meated portion of the back extending about six or eight inches on either side of the back-bone. The fat back is the fat that covers the lean loin. The "prime bacon" is that portion of the side left after the spare-ribs and trimmings have been removed.

Under "ham" is included that portion of the carcass back of the point from which the pelvic bones divide. The ham is the above-named portion trimmed for market use. The terms "trimmings" and "legs" are self-explanatory.

As previously explained, the heads of Nos. 2 and 4 cut out rough, as the records indicate.

The shoulders of these hogs were peculiar. Nos. 1 and 2 show an even, heavy deposit of lean in the butt and in the California ham, although No. 1 shows considerable fat, as was pointed out in the live animal. The coarse legs show prominently in the carcasses of Nos. 2 and 4, correlating with the observation made upon the head. The cleanness of No. 1 and the coarseness of No. 3 is well indicated by the weight of the trimmings from the respective shoulders.

The kidney fat is found in about the relation that might have been expected, No. 3 having the greatest amount, while the others followed in the order of 1, 2, and 4, as indicated by the percentages recorded in the above tabular statement.

The loin and fat back figures did not explain the situation, as quality should here have a strong consideration. It will be noticed, however, that Nos. 2 and 4 cut a higher percentage of loin than did the others, and that they were closely followed by 1. On the other hand, the fat backs are heavier in Nos. 1 and 3. The deciding factor as to which carcass should be placed first was the degree of finish which they showed. No. 1 was nicely finished; No. 2 was under finished and soft, while No. 3. was over fat, the flesh being soft and the fat very oily; No. 4 was extremely watery and carried but very little fat. The matter of quality and finish had, in fact, much to do with the placing, and the cooking trial gives proof of the correctness of the decision from the carcass inspection. The bacon cut, if decided by the percentage alone, would warrant the placing of No. 2 first, but the quality did not agree with the percentage testimony. No. 3 would rank second according to weight percentage, but the extremely uneven disposition of fat, the coarseness of fibre in the lean meat and the oiliness of the fat would not permit such a placing, and in addition to the above faults the quality of the carcass must be added, the uneven belly line and peculiar form made by the loss from an exceedingly heavy weight of trimmings from this individual. No. 2 therefore proved its superiority.

In the yield of hams, No. 4 was quite superior, but like the range steer, the part was fairly well filled and the percentages based upon a lean body were high. The vast amount of water carried and the softness of the ham from No. 4 did not warrant in placing it first. No. 3 was fat and extremely wasteful in trimmings. Nos.

1 and 2 were perhaps the best hams, although No. 2 was light and lacked in firmness.

THE COOKING TRIAL.

For this purpose the five corresponding ribs were taken from each individual carcass and roasted. The tests show what the relative percentages of roasted weight to raw weight of meat was. No records were obtained as to how much of the loss was due to evaporation of water and how much to a loss of fat alone. The remaining liquids in the roasting-pans showed plainly, however, that in the cases of Nos. 1, 2 and 3 the loss was mostly oil, while No. 4 was largely water.

No. 1 roasted much the best. This was to be expected of the better finish and firmness of the flesh and fat. No. 2 was slightly under finished, with a result of a loss of both fat and water. No. 3, the over-fat, soft carcass fried out a large quantity of oil. This at once revealed one of the most important factors to be considered in finishing carcasses, viz., that of not carrying the fattening process too far. No 4 showed a result in percentages following closely those of No. 3. The real result was not similar, for instead of frying out oil, its shrinkage was from a loss of water. The raw carcass was very watery and not at all firm. The variation in percentages show the necessity of quality and of finish to curtail loss in cooking.

When the judges passed upon the cooked product No. 2 was placed first, No. 1 second, No. 4 third, and No. 3 fourth. The difference between No. 1 and 2 was very slight. The deciding factors were tenderness and flavor. No. 1 was somewhat too rich; No. 3 was too oily. Flavor and desirability relegated Nos. 3 and 4 to the last two places. The greater difference between the two groups consisting of Nos. 1 and 2 on the one hand and of Nos. 3 and 4 on the other, and the distinction was marked.

The cooking test and the block test thoroughly analyzed the animals and showed the feasibility of this method of determining the exact merits of fat animals.

O. ERF.

The railroads have granted a rate of one and one-third fare for the round trip, from all points in Kansas and including Kansas City and St. Joseph, Mo., on the certificate plan, to attend the Commencement exercises and triennial alumni reunion. Tickets on sale June 10, and good returning till June 19.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres.....Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres.....Sedan
HON. J. S. McDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Professor Erf has received from New York about \$40 worth of eggs for setting purposes and has turned them over to the maternal care of the incubator.

Professor Valley will go to Ellsworth, May 26, to sing at the high school commencement. Mrs. Valley will accompany him. The professor and his melodious baritone are getting popular all over Kansas.

A. B. Carnahan and Will Barnard will go to Lynn, Mass., immediately after Commencement to accept positions with the General Electric Company located at that place. Both of them are students in the Mechanical Engineering Department, and will graduate in June.

Professor and Mrs. McKeever are happy over the arrival of a brand new baby boy. The professor was called out by the students at chapel on Friday morning and responded with a humorous speech on the progenitors of Junior McKeever and his prospects of becoming a member of the class of 1924.

The last lecture of the College lecture course was delivered in the Auditorium last Thursday night by Doctor Gunsaulus, president of the Armour Institute in Chicago. The Doctor also addressed the engineering students in Professor Eyer's lecture-room Friday forenoon at the third hour, on the subject of "How to fail in Engineering."

Students interested in agriculture should not fail to notice the plot of winter barley northeast of the College barn, near the Williston place. This barley is over two feet high, is an excellent stand, was well headed by May 10, and will soon be ready for harvest. It is expected that if a winter barley can be bred which will be perfectly hardy in this locality that a decided advantage will be gained, since its earliness will help it to avoid the hot, dry weather of early summer, and make it a much surer crop.

The program for Commencement week is about completed and will be published in full in the next number of the INDUSTRIALIST. The baccalaureate sermon will be delivered on Sunday, June 11, by Pres. J. H. McMichael, of Monmouth College, Illinois, and the annual address by Governor Hoch, on Thursday, June 15. These addresses, together with the triennial meeting of the alumni and the fact that this will be the first Commencement held in the Auditorium, will undoubtedly bring large numbers of people to the closing festivities of the College.

ALUMNI AND FORMER STUDENTS.

Annie (Shipman) Frey, student in 1889, has been here from Chase county visiting her sister, Mrs. Breese, and other friends in town.

Dr. Schuyler Nichols, '98, has disposed of his interest in the firm of Nichols & Nichols, at Liberal, Kan., and has joined Doctor Southerland at Herington, where he will practice as physician and surgeon. R. T. Nichols, '99, will continue to practice at Liberal.

Dr. E. F. Nichols ['88], professor of physics at Columbia University, has been awarded the Everest Kempton Adams research fellowship, recently established at Columbia University by Mr. E. D. Adams in memory of his son. Professor Nichols has at present leave of absence and is working at Cambridge University.—*Science*.

Captain Mark Wheeler, '97, and Jennette Carpenter, junior in 1897, and professor of domestic science at the Michigan Agricultural College, were married May 10 at the residence of the bride's brother, in Lansing, Mich. They visited Captain Wheeler's family last week, enroute to the Philippines. The congratulations and best wishes of very many friends are lavishly bestowed upon the young couple.

John R. Callahan, C. S., U. S. A., student in 1889, passed through Manhattan April 22 on his way from the Philippines to his present station, Plattsburgh Barracks, N. Y. He writes to Professor Walters making inquiries concerning the students and Faculty of former days. While in the Philippines he frequently saw Colonel Harbord, '86, and notes that "He keeps well and is much heavier than of old."

Ernest F. Nichols, '88, has recently received a very unusual honor, being invited by Sir William Crookes to lecture before the Royal Institution on "Radiation Pressure." The invitation was accepted and the address was to have been given on the 12th instant. The Royal Institution is one of the most exclusive of the English scientific societies. Professor and Mrs. Nichols are receiving other distinguished courtesies during their sojourn in England. They recently dined with Ambassador Choate.

NOTICE.—The following graduates of the College have not been located. If the INDUSTRIALIST readers can furnish information as to the whereabouts and occupation of any named, kindly report the same to Miss Lorena E. Clemons at once in order that the catalogue may be revised: Edgar F. Clark, '74, Emma (Hoyt) Turner, '80, Darwin S. Leach, '81, Edward V. Cripps, '82, Katie (Meguire) Sheldon, '83, William A. Corey, '84, Frank W. Dunn, '84, Nellie J. Murphy, '85, Edgar A. Allen, '87, William J. McLaughlin, '87, Geo. N. Thompson, '87, Albert E. Martin, '91, Geo. W. Wildin, '92, George Lane Melton, '93, Ernest B. Coulson, '96, and Chas. S. Evans, '96.

The apple orchard belonging to the Kansas State Agricultural College received the first spraying of the season last week. The trees are nearly all fourteen years old, good big trees for the most part, and the amount of spray required to thoroughly spray them was considerably larger than in previous seasons. The spray used was the combination for fungi and insects—Bordeaux Mixture (6:4) strength and arsenate of lead (Disparene), making the most expensive mixture of any used. The orchard contains 303 trees, which are in a nearly square block, making short rows, the most expensive arrangement for operating the spraying machine, which is a 150-gallon tank, force pump and gasoline engine mounted on a four wheel truck. The expense was:

Water, 750 gallons	No charge
Lime, 60 pounds at \$1.20 per barrel	\$0 36
Copper sulphate, 90 pounds at 7½ cents per pound	6 75
Disparene, 45 pounds at 15 cents per pound	6 75
Labor, 34 hours at 12½ cents per hour	4 25
Team, 13 hours at 15 cents per hour	1 95
Gasoline, 3 gallons at 17 cents per gallon	51
Total	\$20 57

Average per tree nearly .068.

An experiment was conducted by the Dairy and Animal Husbandry Department at the Kansas State Agricultural College in which a comparison was made between feeding Kafir-corn meal four parts and soy-bean meal one part, and corn-meal fed alone. Two lots of twelve pigs each were fed for 28 days. At the beginning of the experiment the average weight of Lot I, or that fed Kafir-corn and soy-beans, was 178 pounds, and of Lot II, 168 pounds. At the end Lot I averaged 208 pounds, and in the Lot II, 194 pounds. To determine the relative profits the cost of feed was also considered.

	Pounds fed.	Value of feed.		Cost per 100 lbs. gain.
		Per ton.	Consumed.	
Kafir-corn.....	1674.8	\$11.50	\$9.63	\$4.07
Lot I. Soy-beans.....	419.2	25.00	5.24	
			\$14.87	
Lot II. Corn-meal.....	2256.0	\$12.50	14.10	4.55

It is readily found that Lot I gained 18 per cent more than Lot II and consumed 162 pounds less feed, Lot I consuming 573.7 pounds for 100 pounds of gain, and Lot II 726.5 pounds for the same gain. Animals require a certain proportion of the nitrogenous feeds to the carbonaceous. If given feeds that come near that balance, less feed is consumed and greater gains are made. On the contrary, if animals are fed a carbonaceous ration, as in this case, corn only, a greater bulk of feed will be consumed in order to obtain the protein matter than if some feed rich in such matter was also given. Further than that the excess of the carbonaceous matter will be thrown off from the body as waste.

Historical Society

VOL. 31

NO. 35

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, • **PRES. E. R. NICHOLS**
Local Editor, • • **PROF. J. D. WALTERS**
Alumni Editor, • **PROF. J. T. WILLARD**

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K.S.A.C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K.S.A.C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B.S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U.S.A.....	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)...	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M.S.A. (Ia. State Ag. Coll.), D.V.S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I.T.U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K.S.A.C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor.Sch.Phys.Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K.S.A.C.).....	Secretary
JACOB LUND, M.S. (K.S.A.C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K.S.A.C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University)...	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K.S.A.C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)...	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K.S.A.C.).....	Instructor in English
Walter E. Mathewson, B.S. (K.S.A.C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K.S.A.C.).....	Assistant in Music
William Anderson, B.S. (K.S.A.C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.)	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K.S.A.C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K.S.A.C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K.S.A.C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K.S.A.C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H.C.A. & M.A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K.S.A.C.).....	Assistant in Printing
Miss Caroline Hopps, Ph.B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K.S.A.C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K.S.A.C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B.A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B.S. (K.S.A.C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K.S.A.C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K.S.A.C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D.V.M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K.S.A.C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B.S. (K.S.A.C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K.S.A.C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., MAY 27, 1905.

NO. 35

KANSAS EXPERIMENT STATION EGG-LAYING CONTEST.

(Press Bulletin No. 140.)

THE records of the egg-laying contest, arranged by the Kansas White Wayndotte Club and conducted by the Dairy and Animal Husbandry Department of the Kansas Experiment Station, has been completed for the first half of the year.

The fowls in the contest made an excellent egg-laying record, and the results compare favorably with those of previous authentic egg-laying contests. Better performances could probably have been made had it not been for some of the unfavorable conditions which always accompany the carrying on of a contest; as, for instance, the transportation and frequent handling of the fowls, their adaptation to new and strange surroundings and confinement to smaller yards than they had probably been used to, all of which tend to diminish the egg yield. Beside this, the winter was the most severe ever known in the State. However, the houses in which the birds were wintered were built to meet these conditions, but it would have provided more comfortable quarters if a larger number of birds for each pen had been furnished by the club.

The following is the list of competing birds, with notes on their performance:

First pen, Rose Comb White Leghorn, owned by Mrs. Jennie E. Warren, Cottonwood Falls, Kan.—These were fairly well matured pullets. They seemed rather out of condition at the beginning of the contest, but recovered and gave excellent results through the winter. They were not affected by the low temperature as readily as the Single Comb White Leghorns. No. 25 of this pen became sick in the early part of February, the ailment being what is commonly called "going light," and the pullet died the last of March and was replaced by No. 89 on April 5.

Second pen, Light Brahmas, owned by Mr. F. A. Brown, Onaga, Kan.—These birds have been in the best of condition up to the

present time. The small egg production early in the season must be explained by the fact that they are slow-maturing fowls. In this pen and, excepting the Leghorns, in all pens, the egg yield fell during April, owing to the broody condition of the hens. All broody hens were promptly removed to a strange pen to break up this condition, and in ten days were again ready for laying.

Third pen, Barred Plymouth Rocks, owned by Mrs. J. W. Jones, Abilene, Kan.—This pen consists of hens, while all others entered were pullets. This was due to an unfortunate misunderstanding, and is manifestly unfair to the breed, for hens are generally considered to be poorer winter layers than pullets. The hens were inclined to over-fatness and were heavy eaters.

Fourth pen, White Wyandottes, owned by Beecher & Beecher, Belleville, Kan.—These pullets have been in prime condition up to the present time.

Fifth pen, American Reds, owned by Dr. J. Martin, Wichita, Kan.—These pullets were laying when shipped to the College, being the only ones laying at the time. They laid heavily until January 1, 1905, when several of them molted and stopped laying. They are more inclined to broodiness than any other breed in the contest.

Sixth pen, Buff Wyandottes, owned by Mr. C. G. Wheeler, Harlem, Mo.—These pullets have done well up to the present time.

Seventh pen, Single Comb White Leghorns, owned by the Kansas State Agricultural College.—These pullets did well also, but suffered more from the severe cold than any other breed. No. 60 suddenly died April 17, and was immediately replaced by No. 7.

The accompanying tables give the egg yield and the value and cost of feed figured according to local markets. At the close of the year more complete results, including the brooding periods, fertility of eggs and other points of interest, will be published. A study of the tables will reveal a surprising difference in the individuality of the hens. This contest should prove much more interesting and instructive than previous contests where on records of individual performance were kept.

THE INDUSTRIALIST.

549

ROSE COMB WHITE LEGHORNS.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.*	Gain.
6.....		12	18	22	23	17	92	\$1.278	\$0.439	.....	\$0.839
8.....	3	14	15	5	24	14	75	1.031	.439	.....	.592
25.....		14	14	3	.....	.....	31	.512	.361	.....	.151
68.....		.....	11	1	19	13	44	.552	.439	.....	.113
94.....		3	5	6	21	21	58	.718	.439	.....	.279
98.....	3	16	17	17	23	20	96	1.336	.439	.....	.897
89.....		.....	.....	.....	.....	8	8	.086	.065	.....	.021
Total.....	6	61	80	54	110	93	404	\$5.513	\$2.621	.....	\$2.892

LIGHT BRAHMAS.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
8.....		4	9	10	23	17	63	\$.81	\$.525	.....	\$0.285
18.....		2	20	12	34	.383	.525	\$0.142	.....
21.....		10	13	16	10	49	.655	.525	.....	.130
25.....		2	18	18	15	53	.674	.525	.....	.149
54.....		13	17	30	.327	.525	.198	.....
70.....		21	17	38	.416	.525	.109	.....
Total.....	4	21	43	111	88	267	\$3.265	\$3.150	.....	\$0.115

BARRED PLYMOUTH ROCKS.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
7.....	2	15	.....	2	22	11	52	\$0.676	\$0.527	.....	\$0.149
10.....		.....	.....	2	19	17	38	.425	.527	\$0.102	.....
45.....		14	20	10	24	18	86	1.177	.527	.....	.650
67.....		.....	.....	.....	23	13	36	.395	.527	.132	.....
70.....		.....	.....	.....	20	13	33	.362	.527	.165	.....
98.....		.....	.....	.....	18	16	34	.372	.527	.155	.....
Total.....	2	29	20	14	126	88	279	\$3.407	\$3.162	.....	\$0.245

WHITE WYANDOTTES.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
4A4.....		14	.....	2	23	16	55	\$0.689	\$0.507	.....	\$0.182
4A7.....		.....	.....	.....	24	17	41	.452	.507	\$0.055	.....
4C9.....		.....	19	10	22	13	64	.849	.507	.....	.342
4C11.....	2	22	24	19	24	21	112	1.585	.507	.....	1.078
4C12.....		.....	.....	.....	23	18	41	.449	.507	.058	.....
B1B.....		.....	.....	.....	23	16	39	.429	.507	.078	.....
Total.....	2	36	43	31	139	101	352	\$4.453	\$3.042	.....	\$1.411

AMERICAN REDS.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
3.....	15	24	19	.....	19	16	93	\$1.369	\$0.499	.....	\$0.870
6.....	17	23	10	1	19	13	83	1.222	.499	.....	.723
214.....	10	12	.....	1	24	17	64	.833	.499	.....	.334
218.....		.....	6	3	22	16	47	.564	.499	.....	.065
233.....	3	23	19	17	22	13	97	1.399	.499	.....	.900
340.....	14	19	.....	2	24	19	78	1.069	.499	.....	.570
Total.....	59	101	54	24	130	94	462	\$6.456	\$2.994	.....	\$3.462

BUFF WYANDOTTES.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
6.....		20	21	14	21	15	91	\$1.293	\$0.513	.....	\$0.078
12.....		12	17	16	22	18	85	1.169	.513	.....	.656
14.....		9	18	2	22	19	70	.930	.513	.....	.417
20.....		3	16	16	27	14	76	1.016	.513	.....	.503
42.....			10	19	18	18	65	.857	.513	.....	.344
459.....				8	.....	.....	8	.124	.513	\$0.389	.....
Total.....		44	82	75	110	84	395	\$5.389	\$3.078	.....	\$2.311

SINGLE COMB WHITE LEGHORNS.

No.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Total	Value.	Feed cost.	Loss.	Gain.
3.....	6	16	3	6	23	21	75	\$0.996	\$0.437	.....	\$0.559
7.....						5	5	.054	.032	.....	.022
19.....		5	2	10	21	13	51	.643	.437	.....	.206
21.....		5	3	4	25	20	57	.688	.437	.....	.251
50.....		4	6	1	21	19	51	.620	.437	.....	.183
51.....	8	16	2	12	20	17	75	1.053	.437	.....	.616
60.....		3		1	21	8	33	.364	.407	\$0.043	.....
Total.....	14	49	16	34	131	103	347	\$4.418	\$2.624	.....	\$1.794

O. ERF AND M. M. HASTINGS.

Secretary Wilson, of the Agricultural Department, Washington, D. C., who passed through Manhattan Monday, May 15, accepted President Nichols' invitation and stopped off a couple of hours to shake hands with the professors. He made a brief visit to the barns and corrals, strolled through the experimental fields, and made a short address in the Auditorium to the students and a hurriedly collected audience of citizens. In the course of his address the secretary said many complimentary things concerning this College. He remarked that he had never seen a more beautiful campus in any state; that this was the model agricultural school of America; that he had in his corps of experimenters and explorers a large number of graduates from Manhattan and that they were the best he had, and that he was looking for more of them. He spoke of the great value to the country of the scientific and practical training of the land-grant institutions in general and gave examples of how scientific research was benefitting agriculture, stock-raising, and horticulture. The remarks of the secretary were well received and applauded, and the band and the students responded with music and College songs. Secretary Wilson was accompanied by Prof. W. J. Spilman, in charge of the department of grasses and forage crops; M. A. Carleton, expert cerealist, and his son and secretary, Jasper Wilson. The party was escorted by John Sebastian, passenger traffic manager; L. M. Allen, general passenger agent; George T. Boggs, vice-president, and several other Rock Island officials. Other prominent agriculturalists accompanying the secretary were: Secretary Coburn, and President Robinson of the State Board of Agriculture, President Nichols, and Professor Erf, of this College.

PROGRAM FOR COMMENCEMENT WEEK, 1905.

Friday, June 9

Societies' Commencement Lecture to Invited Guests, College Auditorium,
8 p. m., Dr. Montaville Flowers, President Flowers' Academy
of Speech and Dramatic Art, Cincinnati.

Sunday, June 11

Baccalaureate Sermon, College Auditorium, 4 p. m., Rev. T. H. McMichael,
President Monmouth College, Monmouth, Ill.

Monday, June 12

Recital by Music Department, College Auditorium, 8 p. m.

Tuesday, June 13

Examinations from 8:30 a. m. to 2:40 p. m.
Class-Day Exercises to Invited Guests, College Auditorium, 8 p. m.

Wednesday, June 14

Examinations from 8:30 a. m. to 11:50 a. m.
Reunion Literary Societies, 1:30 p. m.
Business Meeting Alumni Association, 3:30 p. m.
Reunion of classes, 4:30 p. m.
Triennial Alumni Address, College Auditorium, 8 p. m.
Prof. F. A. Waugh, Amherst, Mass.

Thursday, June 15

Annual Address, College Auditorium, 10 a. m., by Governor Hoch.
Presentation of Diplomas.
Cadet Band Concert, College Auditorium, 2 p. m.
Military Drill, 3 p. m.
Triennial Alumni Banquet, Women's Gymnasium, 7 p. m.

SPRING TERM PROGRAM, 1905, SHOWING IN

INSTRUCTORS.	First Hour.	Second Hour.	Third Hour.	Fourth Hour.
Walters.....	Arch. Drawing...3	Heat & Vent...3	Projection I...19	Specifications...4
Evans.....	Home Dec.†...27			Obj. Dr. W & F...10
Weeks.....				Geom. Dr. T & T...6
Willard*.....	Chemistry II...44	Adv. Organic...8	Chemistry V†...42	Ag. Chem.†...22
Mathewson.....	Chemistry III & Laboratory.....27			Chem. IV†...15
McClenahan.....			Chemistry III and Laboratory.....37	
Popenoe*.....	Entomology Elective.....7		Zoology.....24	Geology.....4
Dean*.....	Entomology.....18	Entomology.....35	Special Entomology.....2	
Scheffer.....				
Romick.....	Anal. Geom.....22	Anal. Geom.....26	Def. Int.†.....9	
Halstead.....	Algebra III.....35	Algebra IV.....46	Diff. Eq.†.....20	
Zeininger.....	Algebra II.....32	Algebra II.....33	Algebra III.....19	Geometry II.....23
Booth.....	Algebra I.....25	Geometry I.....29	Geometry I.....27	Algebra III.....21
Seaton.....	Geometry I.....27	Algebra III.....37	Geometry II.....32	Geometry I.....26
Eyer.....	Alt. Current.....13	Power Trans.....13	Trigonometry.....29	Trigonometry.....26
Hamilton.....	Physics IV.....14	El. Physics.....26	Dynamo Des.....13	
Anderson.....			El. Physics.....15	El. Physics.....23
Roberts*.....		Plant Diseases.....2	Botany II.....29	Electricity.....21
Freeman*.....	Botany II.....32	Botany II.....32	Botany I.....35	Botany II.....26
Hongham.....	Adv. Grammar, 23	Meth. & Mang...10	Psychology.....15	Botany I.....36
McKeever.....	Thermo. III.....6			Logic.....8
McCormick.....				Shop Lect. II, F, 46
Potter.....		App. Mech.....7	Valve Gears.....7	Shop Le. IV, Th, 8
Dearborn.....				Mechanics.....19
House.....	Woodwork II...11	Woodwork I...17	Woodwork II...7	
Wabnitz.....				Woodwork I...17
Ridenour.....				Shop Lect. I...11
Nicholson.....				
Dickens*.....	Horticulture...37	Veg. Gard.....28		
Eastman*.....	Orn. Shrubs.....1			Forestry.....1
Brink.....	Eng. Lit. II.....12	Rhetoric II.....45	Am. Lit.†.....11	Readings.....20
Rupp.....	Adv. Comp.....22	Classics.....19	Adv. Comp.....23	Adv. Comp.....25
Rice.....	Rhetoric I.....27	Rhetoric I.....27	Classics.....22	Composition.....15
Hopps.....	Composition.....16	Composition.....27	Readings.....35	Rhetoric I.....11
Ten Eyck*.....	Farm Mgt.....25		Farm Mgt.....24	
Shoesmith*.....		Crop Prod.....11		
Kyle.....	Agriculture.....25	Domestic Sci...8		
Calvin.....			Therapeutics.....(1) 22, (2) 23	
Rose.....				
Pancake.....	Elementary Cookery.....6			
Price.....	Civics.....35	Civics.....34	Am. History...36	Am. History...37
Kammeyer.....	Economics.....27		Pub. Speaking I, 32	
Erf*.....		Animal Husb...14		Feeds & Feed'g, 23
Kinzer*.....				
Melick.....				
Cortelyou.....	German III.....30	German III.....28	German II.....18	German III.....43
Valley.....	Singing.....23	Singing.....15	Singing.....17	Singing.....28
Brown.....	Instrumental, 16 hours, 71; Theory, 3 hours, 38;	Piano.....15	Orchestral Instruments, 5 hours, 26; Band	Piano.....26
Augsburger.....	Piano.....15	Anatomy.....6	Piano.....13	
Schoenleber*.....				
Barnes*.....	Bact. (1) 23, (2) 23	Physiology...31	Physiology...47	
Foster.....		Printing.....5	Printing.....3	Printing.....9
Rickman.....	Printing.....3			
Rodell.....		Bookkeeping...34	Algebra II.....32	Algebra I.....28
McFarland.....		Grammar B.....9	Grammar A.....33	Adv. Grammar, 21
Holroyd.....	Arithmetic A...41	Anc. History...27	Medieval Hist...38	Medieval Hist...45
Short.....	Anc. History...23	U. S. History...6	Geography.....2	Arithmetic B...8
Thompson.....	U. S. History B...6	Phys. Geog. II. 21	Chemical Laboratory.....	
Loomis.....	Phys. Geog. II. 21		Physical Geo. I, 23	
Colliver.....				Physical Train...12
Barbour.....				Sewing I.....14
Barnes.....	Advanced Dressmaking.....8			
Cowles.....			Sewing II.....3	
Coe.....	Sewing III.....9			
Lund.....				

*Experiment Station Work.
†Classes Alternate.

Morning Class Hours (Tu., Wed., Thur., Fri., Sa.)
1. From 8:35 to 9:20.
2. From 9:25 to 10:10.
3. From 10:15 to 11:00.
4. From 11:05 to 11:50.

INSTRUCTOR, SUBJECTS, AND NUMBER IN CLASS.

Fifth Hour.	Sixth Hour.	Seventh Hour.	Eighth Hour.
Projection I.....	Th. 13; F. 38		
Projection II.....	Tu. 13		
Object Drawing.....	Wed. 19; Th. 15; Sat. 12		
Geometrical Drawing.....	Tu. 18; Fri. 24		
Freehand Drawing.....	Wed. 33; Th. 39		
Chemistry V Laboratory.....	Tu. & Th. 44		
Organic Chemistry Laboratory.....	Wed. & Fri. 8		
Chemistry II Laboratory.....	Tu. 20; Th. 17		
Chemistry IV Lab.....	Wed. & Fri. 13; Tu. & Th. 11		
Entomology Laboratory.....	Wed. 18; Th. 19; Fri. 17		
Zoology Laboratory.....	Th. & Fri. 10	Zoology Laboratory.....	Th. & Fri. 10
Surveying.....	68		
Laboratory.....	13		
Physics Laboratory.....	24		
Elect. Laboratory.....	Tu. & Th. 11; Wed. & Fri. 10		
Mechanical Drawing I.....	Wed. 23; Fri. 25		
Engineering Laboratory.....	Th. 6		
Mechanical Drawing IV.....	Wed. & Fri. 11		
Mechanical Drawing VII.....	Tu. & Th. 7		
Mechanical Engineering Laboratory.....	6		
Mechanical Drawing I.....	Wed. 25; Fri. 23		
Pattern Making.....	47		
Machine Shop.....	Tu. & Th. 5; Wed. & Fri. 5		
Foundry.....	Tu. & Th. 3		
Blacksmithing I.....	Tu. & Th. 19; Wed. & Fri. 17	Blacksmithing II.....	Tu. & Th. 4; Wed. & Fri. 4
Orn. Gardening.....	21		
Hort. Lab.....	Tu. & Th. 28; Wed. & Fri. 7; Sat. 1		
Domestic Science III.....	Tu. & Th. 12; Wed. & Fri. 13		
Laundering.....	Tu. 10; Th. 12; Sat. 12		
Pub. Sp. II, (1) 15, (2) 25			
Animal Husbandry.....	14		
Dairying.....	5		
Singing.....	28	Singing.....	19
5 hours. 37.....			
Piano.....	20	Piano.....	6
Physiology Laboratory.....			78
Bacteriology Lab.....	Tu. & Th. 16; Wed. & Fri. 17	Bacteriology Laboratory.....	Tu. & Th. 13
Printing.....	23	Printing.....	3
Sewing I and II.....	Physical Training.....	Physical Training.....	26
Sewing III.....	Tu. & Th. 18		
Traction Engine.....	50		

Afternoon Class Hours (Tu., Wed., Thur., Fri., Sat.):

5. From 1:05 to 1:50.
6. From 1:55 to 2:40.
7. From 2:45 to 3:30.
8. From 3:35 to 4:20.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres.....Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres.....Sedan
HON. J. S. McDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Professor Dickens has given the College orchard its first spray for the season.

Professor Roberts and Mr. Freeman begin hybridization work on cereals this week.

Regents McDowell and Fairchild were at College on May 20, transacting committee business.

Mr. Freeman has prepared a careful and elaborate cross-index of species of grasses now growing in the botanical garden.

The Botanical Department's plots of native ornamental plants, west of the main building, are well worth going out to see.

Supt. Hugh Durham, of Jewell county, writes: "Next spring we hope to visit you with a train load of teachers and students from this county."

Miss Eleanor Harris, assistant in music at the College from 1902 to 1905, has been elected a member of the faculty of the Von Schiller's College of Music, Chicago.

Miss Emma Headersted, of the Dairy and Animal Husbandry Department, has resigned her position and left for Blue Rapids, where she has a position with Russell & Hunter at an increased salary.

The field meet of the Kansas Normal School and this College, in the Manhattan City Park last Monday, was well attended and highly interesting. The Normalites were victorious, but the score was a very close one.

The Highland Park (Des Moines, Iowa) baseball team was defeated by the K. S. A. C. nine at Athletic Park last Thursday afternoon by a score of 5 to 0. This is one of the strongest teams that visits the State and our boys are justified in feeling hilarious.

About twenty-eight students, accompanied by Regent Story, Professors Erf and Kinzer, Colonel Brady and wife, and Miss Ella Weeks, visited the Thompson ranch, at Dover, last Monday for the purpose of inspecting the thoroughbred Hereford cattle. Four rigs met them at Willard and gave them a cross-country drive to the farm. At noon they were treated to a sumptuous dinner. A few of the cattle were scored, but on account of numbers they were obliged to content themselves with merely looking over the main herd.—*Students' Herald*.

Senior student, D. A. Logan, has accepted a position as clerk to the road-master for the C. R. I. & P. Ry. Co. His office and headquarters will be at McFarland, Kan. Mr. Logan will return Commencement and graduate with his class.

Professor Roberts has succeeded in arranging for a series of acclimatization experiments with corn to be carried on by the experiment stations of Manitoba, Canada, North and South Dakota, Nebraska, Kansas, and Texas, in cooperation. Experiments on acclimatization with other plants are planned with the experiment station of Cuba.

Manhattan will soon have a derby. A portion of the Sarber farm, across the Blue river, is being improved for a driving track built by the Manhattan Driving Club. The grading is already finished. The work of building a fence will soon be started. It is expected that the track will be in good condition by July 4. The place will be an ideal one.

D. Peterson, father of J. B. Peterson, '07, whose farm is located in Sedgwick county, near Wichita, Kan., sent to the College a sample of this year's alfalfa, cut May 1, which measures twenty-eight inches in height. This alfalfa is grown on upland, rather sandy soil. Mr. Peterson reports that he cut five good crops of alfalfa hay from his field in 1904.—*Students' Herald*.

Professor Ten Eyck has received a letter from Broughton, Australia, thanking him for a copy of Bulletin No. 43, of the Experiment Station. The writer evidently believes in the benefit of experimental work as carried on at this College. The letter reads in part: "Allow me to congratulate you on the result of your studies of plant life, revealing, as they do, hitherto unknown phases, and making us confidants with nature in her wonderful secrets. Work such as yours cannot fail to be of absorbing interest to all who would desire to have more than the usual superficial and elementary knowledge of that little understood term, 'farming.' In the future I may be tempted to avail myself of your valuable aid, the assurance of which closes a letter which is esteemed as a very great favor."

The Club of Aquatic Sports will give their first public exhibition on the afternoon of June 5. The games will be given at the Wild Cat pool, a quarter of a mile southwest of the county poor-farm. The program of the day will consist of swimming races, contests in diving, plunging, trapeze and spring-board tumbling, and last and perhaps most interesting a game of water polo. These contests are open to all students and instructors of the College. Coaches have been elected for all the various contests and practice has already begun. Mr. Ahearn will coach the water polo players, Secretary McLean, those wishing to enter the swimming races, while Milo Hastings will arrange the diving contests and miscellaneous events. Those wishing to enter should report to these men and begin regular practice at once.

The Kansas State Horticultural Society will hold its twenty-first summer meeting in the council chamber of the city of Wichita, Kan., on June 7, 8, and 9, 1905. The meeting will be open to everybody. Program on application to William H. Barnes, secretary, state-house, Topeka, Kan.

Engineer Lund tells us that he contemplates a large amount of repairing and rebuilding in the Heat and Power Department the coming summer. One, or possibly two, of the large boilers will be renewed, and all the boilers on the east side of the powerhouse will be reset. The question of a new smoke-stack will have to be answered. The College must either build a new smoke-stack that will be adequate to produce the required draft, or must construct a mechanical draft fan in the present stack. Either plan will be expensive. A new stack will cost about \$3000, while a draft fan will require a constant supply of power, which in the long run will be expensive also.

The Heat and Power Department has had a good deal of trouble with the new pump station, built last summer, from the excessive quantities of quick-sand which found its way into the well and into the pumping machinery. Superintendent Lund believes, however, that he has finally succeeded in stopping the "yellow peril" by tubing the well and forcing all the water to enter the casing from below, where the soil consists of a stratum of coarse sand and gravel to the height of about ten feet. The total depth of the well is sixty-two feet, of which about twenty-six feet are dug and walled up with brick. The remainder is simply a bore hole ten inches wide at the top and six inches at the bottom. This bore hole had been cased from the start, but it leaked and permitted the sand to enter the tubes. A new set of valves will be substituted for the worn-out valves as soon as the results will seem satisfactory. The water consumption of the College is at present about twenty thousand gallons per day.

A large crowd attended the annual inter-class track meet of the College at the City Park on May 15. The four classes were represented in the contests. The juniors made the highest number of points and the sophomores scored second. The races and the tug of war proved the most exciting contests. Many of last year's records were broken. The winners of the contests made up the team that met the Normal team last Monday. The following is a list of events, giving names of winners: 100-yard dash, Edelblute, '08; pole vault, Watkins, '06; discus, McGreevey, '07; 220-yard dash, Edelblute, '08; running broad jump, Watkins, '06; $\frac{1}{4}$ -mile run, W. B. Thurston, '06; hammer throw, E. C. Farrar, '06; 1-mile run, Stauffer, '07; 120-yard hurdles, tied by Lawson, '07, and Watkins, '06; high jump, J. B. Thompson, '05; 440-yard dash, Shirley, '05; shot put, McGreevey, '07; 220-yard hurdles, tied by Lawson, '07, and Cunningham, '08; tug of war, Montgomery, Lindsay, McGreevey, Putnam, '07; 2-mile run, Peairs, '05; relay race, W. B. Thurston, Schuler, C. E. Davis, E. W. Thurston, '06.—*Daily Republic*.

Bulletin No. 20, of the Biological Survey, Department of Agriculture, is on "Coyotes in their Economic Relations." Its author is Prof. D. E. Lantz, recently in charge of the work concerning the extermination of noxious mammals in this State, and now assistant in the Biological Survey. The bulletin is a well-written and interesting account of the occurrence and food habits of coyotes, and describes the means employed for destroying them and fencing against them.

ALUMNI AND FORMER STUDENTS.

Carrie B. Oneel, '01, may now be addressed at Potter, Kas., instead of Atchison.

Mary Hall, '04, has changed her address from Burden to 716 North Church street, Winfield, Kan.

Miss Bessie Little, ['91] returned home Saturday from Philadelphia where she has attended the Womans' Medical College during the past winter. She will spend the summer here, returning to Philadelphia next year for her degree.—*Nationalist*.

Miss E. Lynn Hartley [second-year student 1895] and Mr. Whaley, a cousin of Prof. W. E. Whaley ['86], were married at Conway Springs Sunday morning and have gone to Dalton, Sumner county, to live. Mr. Whaley is a grain buyer at that point. Mr. and Mrs. J. W. Hartley, of College Hill, attended the wedding.—*Nationalist*.

We are in receipt of the program of the second annual commencement of the Dunn County school of Agriculture, Menomonie, Wis., of which K. C. Davis, '91, is principal. The subjects chosen by the graduating class are all practical and relate to agriculture or domestic science. From all that we hear the school is doing good work.

Alta L. Jewitt, student in '00-'02, has "sprung a leak" in the journalistic field by launching *The Jasper Gazette*, at Jasper, Mo. It is a seven-column folio, and the third issue was so full of advertisements that it was necessary to issue a supplement. The good taste in the advertisement composition and the general make-up of the paper shows the result of Mr. Jewitt's training in our Printing Department while a student. We wish him success.

William Hayward, student in 1892, having completed the junior year in the Kansas Medical College, Topeka, has been given a license to practice during the summer vacation, and is located at Asherville, Kan. He will complete his medical course next year. During his course he has been assisting in the teaching of chemistry, thus paying his tuition and something besides. Mr. Hayward was an excellent student in this subject, and his success thus far is a fine illustration of what grit and perseverance will accomplish.

Chas. W. Pape, '95, is now in the employ of the Beatrice Creamery Company and has moved from Topeka to Lincoln, Nebr.

OUR ALUMNI IN CHICAGO.

The following telegram was received by President Nichols from the Chicago alumni:

CHICAGO, ILL., May 20, 1905.

Pres. E. R. Nichols,
Kansas State Agricultural College,
Manhattan, Kansas.

The Kansas Agricultural College Alumni Association of Chicago forty-eight in assembly, sends greetings to Alma Mater.

D. G. ROBERTSON, *Pres.*

W. F. LAWRY, *Sec.*

We have received the following excellent report of the recent reunion of College people in Chicago, for which most cordial thanks are tendered Mrs. Beeler:

According to previous announcement, the Alumni and former students of the College residing in Chicago met on the evening of May 19. Promptly at 6 o'clock appeared, as if by magic, from various parts of the great city and its surrounding suburbs, forty-eight of Alma Mater's children and friends, all drawn by one common purpose, to do honor to the institution to which they owe so much, and to strengthen the ties that bind them to the College and to each other.

After meeting and greeting friends, new and old, we were summoned to the spacious dining-room, where an excellent repast was served and eagerly disposed of, for all were anxious for the after-feast of reason and song. Mr. D. G. Robertson in his usual genial manner introduced Mr. Whaley, toastmaster, who presided and entertained with characteristic wit and humor.

Space will permit a rehearsal of only a few of the good things said and felt for the dear old College. All testified to a desire to further its interests until it shall stand highest among institutions of its kind, a model and a leader.

All wish to endorse the sentiments of Professor Williston as to the progress and future growth of the College. He spoke touchingly of the debt owed to former teachers, especially Professors Lee and Mudge and Presidents Denison and Fairchild, as well as other able men who gave the College its start in life. "No institution can thrive that does not teach its students that there is something else in life besides dollars and cents. K. S. A. C. should stand highest in the teaching of technical and scientific knowledge, above all, scientific agriculture. Salaries have been too low. There has been too much politics in the College. The teaching of leaders should be its highest purpose and the application of science to the betterment of the human family." He believes that the future of the Kansas State Agricultural College is bright and that there is no reason why it should not be the best school of applied science west of the Mississippi River.

Mr. Martin, in referring to Alma Mater and the College campus,

called to mind the happy days of yore, when fresh from hamlet, home and farm we came under the care of our "second mother," "our angel mother," who guides our destiny still.

Miss Copeland in an interesting manner reviewed the struggles of an alumnus, with the incense of Commencement fresh in his heart (and his diploma in his suit case ready for instant use) when he steps upon the platform in a great city and learns that life's struggles have indeed begun—but lessons learned at Alma Mater help him to face and surmount difficulty.

The Association was honored by the presence of representatives from the first three graduating classes of the College. A number responded to calls for extemporaneous speeches. Mrs. Martha (White) Abbott responded by introducing her husband, who she said "had been doing the talking for her for over thirty years."

The program was as follows:—

PROGRAM

Toastmaster: William E. Whaley

Piano solo	Ione (Dewey) Sutherland
Reminiscences	Prof. S. W. Williston
Solo—"My Heart is Singing"	Mrs. Mabel (Crump) McCauley
To the Stars Through Difficulties	Miss Minnie L. Copeland
Chicago Alumni	Raymond G. Lawry
Solo—"Spring Song"	Miss Henrietta Hofer
Our Alma Mater	E. T. Martin
Song—"Our Alma Mater"	_____

Extemporaneous Speaking

Song—"Auld Lang Syne"	_____
---------------------------------	-------

Those present were as follows: Mrs. Martha (White) Abbott, '71, George C. Abbott, Lora (Waters) Beeler, '88, George W. Beeler, A. E. Campbell, Mrs. A. E. Campbell, A. L. Cottrell, '03, H. M. Cottrell, '84, Minnie L. Copeland, '98, George F. Dewey, Mrs. George F. Dewey, E. H. Freeman, '95, E. C. Gardner, '04, Mrs. Hofer, Christine Hofer, '02, Henrietta Hofer, '02, Mrs. Ed. M. Hutto, Mell Hutto, Dr. L. B. Jolley, '01, D. M. Ladd, '01, Raymond G. Lawry, '03, W. F. Lawry, '00, George M. Logan, '02, Ellsworth T. Martin, '90, Charles H. McCauley, Mrs. Mabel (Crump) McCauley, '97, Helen Monsch, '04, Marguerite McCullough, Edwin A. Munger, J. V. Patten, '95, Mrs. Hortensia (Harman) Patten, '95, S. N. Peck, '87, Raymond H. Pond, '98, A. J. Reed, '03, Mrs. L. (Paulsen) Reed, David G. Robertson, '86, Mrs. David G. Robertson, Thomas Shirley, Mrs. Beatrice (White) Shirley, Mrs. Ione (Dewey) Sutherland, '93, Jane Chapin Tunnell, '89, Mrs. Kate (White) Turley, '71, Mr. Z. T. Turley, Mary (Pierce) VanZile, W. E. Whaley, '86, A. D. Whipple, '98, and Prof. S. Wendell Williston, '72.

After adopting the report of the committee for a permanent organization, and electing D. G. Robertson president and W. F. Lawry secretary, and singing "K. S. A. C." with spirit, and the words of Auld Lang Syne, and giving the College yell, all reluctantly said adieu, feeling that life was richer and better for their having met together.

The dry, cool spring has caused early planted corn to start slowly and unevenly, resulting in many cases in a rather poor stand, and some farmers are laying this to poor seed. But the seed may not have been poor. Some of the seed-corn which gave a very high per cent of germination when tested has made a relatively poor stand in the fields planted on the Kansas State Agricultural College farm, due to conditions mentioned above.

The Farm Department of the Kansas State Agricultural College has planted breeding plots of nine varieties of corn. Seven of these contain ear tests in which the choicest ears from the highest yielding rows of last year are planted separately, so that the selection may continue to be made according to highest yield and the best quality instead of the outward appearance of the ears. That this work is important is shown by the fact that some of the best rows have yielded 2.5 and 10 times as much corn as the poorest row in the same plot.

A good seed-bed must be moist, warm, and well aerated. The farmer cannot control weather conditions, but he can often, to a great extent, control soil conditions. This spring, on the Kansas State Agricultural College farm, level-planted corn started quickest and most evenly and gave the best stand on early spring plowing, which was well harrowed after plowing and again cultivated before planting. The reason assigned for this is that the early spring plowed land was warmer, more moist and better aerated than fall plowing, or land which had not been plowed.

Kansas is preëminent in the production of winter wheat. For a number of years the Experiment Station, Kansas State Agricultural College, has been originating and testing large numbers of varieties. This work has been done not only at Manhattan, but in coöperation with the United States Department of Agriculture extensive trials have been made at Halstead, McPherson, and Hays. To extend and strengthen this investigation the Station has ordered an experimental reduction mill, such as is used by large milling companies in testing the flour-making qualities of small quantities of grain. This will be installed in the Chemical Department, and interesting and valuable results are looked for from milling and baking tests.

The lesson taught by the corn planting at the Kansas State Agricultural College farm this season is that it pays to prepare a good seed-bed. The soil should be warmed, aerated, and the moisture conserved by early cultivation, and then do not plant too deep early in the spring. Only the surface, two or three inches of the soil, has a temperature high enough during part of the day in early spring to germinate corn. By planting very early, a farmer takes some risk of losing the seed and of being obliged to plant over again, or he may get a poor stand of corn; but the lessons of the past two wet springs, when it was almost impossible to plant at all, were still too fresh in mind to neglect planting when the soil was in such favorable working condition, although it was early in the season and the weather was too cool to insure a good germination of corn.

VOL. 31

NO. 36

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A.M. (University of Iowa).....	President
JOHN D. WALTERS, M.S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M.S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A.M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph.M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B.S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A.B. (U. of K.), M.S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph.M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S.B. (Mass. Inst. Tech.), Prof. of Mech. Engineering, Supt. of Shops	
ALBERT DICKENS, M.S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A.M. (U. of R.), Ph.D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B.S. (K.S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A.M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A.M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University)	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.	Professor of Military Science
JOHN V. CORTELYOU, A.M. (Univ. of Neb.), Ph.D. (Heidelberg)	Professor of German
OLOF VALLEY, B.M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.)	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A.M. (Miami)	Principal Preparatory Department
MISS MARGARET J. MINIS, B.S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.), Director of Physical Training	
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B.S. (K. S. A. C.).....	Secretary
JACOB LUND, M.S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A.M. (K. S. A. C.), Assistant Professor of English	
CLARENCE L. BARNES, D.V.M. (Cornell University)....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B.S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B.S. (K. S. A. C.)	Assistant Professor of Mathematics
ROLAND J. KINZER, B.S. Agr. (Iowa State Col.)....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S.B. (Mass. Inst. Tech.)	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B.S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B.S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A.M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B.M. (Kan. Con. of Music), B.S. (K. S. A. C.)....	Assistant in Music
William Anderson, B.S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School)	Assistant in Drawing
Vernon M. Shoesmith, B.S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B.S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B.S. (K. S. A. C.)	Assistant in Entomology
Miss Emma J. Short	Assistant in Preparatory Department
Miss Ina Cowles, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B.S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B.S. (N.H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A.M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B.S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph.B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A.B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B.S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B.S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B.S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M.S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B.A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B.S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B.S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B.S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B.S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B.S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B.S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B.S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B.S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B.S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., JUNE 3, 1905.

No. 36

RED CEDAR.

THE red cedar is a favorite species with Kansas planters; and justly so, for it is the only evergreen tree native to the State, is hardy and succeeds well in a great variety of soils. It is found along many of the streams in eastern and northern Kansas, well west on the Saline and Solomon, and thirty years ago was found in such quantity in the "canons" along the Medicine river as to be the source of a large number of posts, and was a valued resource of the pioneers after the buffalo bones had all been gathered up and "hailed to the road."

While the red cedar is not rated so highly as an ornamental evergreen as are some of the pines, spruces, and other genera, it is of good appearance. Used as a background or viewed from a distance, a mass of red cedars makes a pleasing picture. As specimen trees the young red cedars are usually of good color and symmetrical form. For parks, cemeteries and even for small plantings the red cedar deserves consideration.

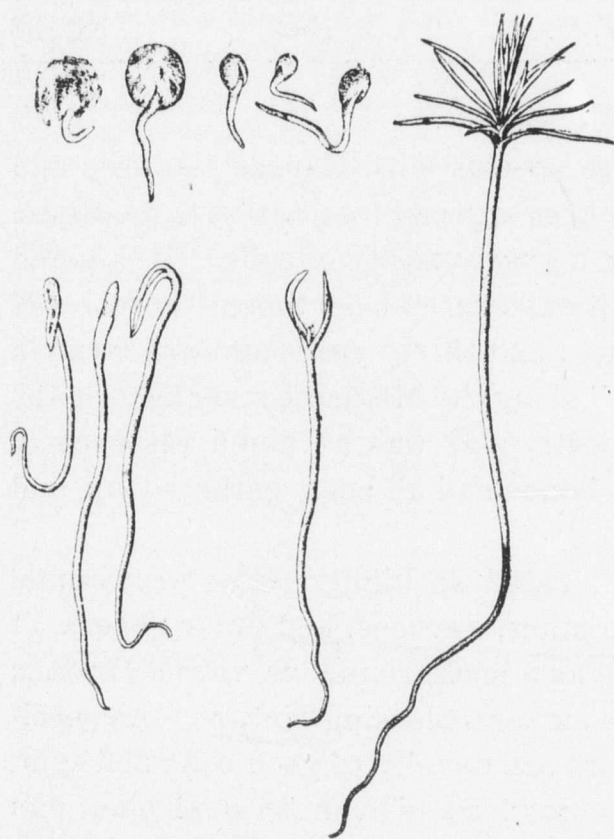
The evergreens are usually considered as more difficult to transplant than are deciduous trees. The plantings made by the Experiment Station have shown that special care is necessary to prevent the roots from becoming dry. The roots of evergreens in drying exude a gum or resinous substance, and if this has taken place new roots do not form readily and the tree dies. Where the roots are protected from the moment they are dug until reset their success compares very favorably with deciduous trees. In recent years tests have been made of shipping young trees three to four feet high in winter, with a small ball of frozen earth about the roots. The trees are dug around before the ground freezes, a hole is dug to receive them, and some earth for filling in is stored in the cellar to prevent freezing. Handled in this way trees have been set in very trying locations with complete success.

The only objection to the red cedar is its liability to the fungus

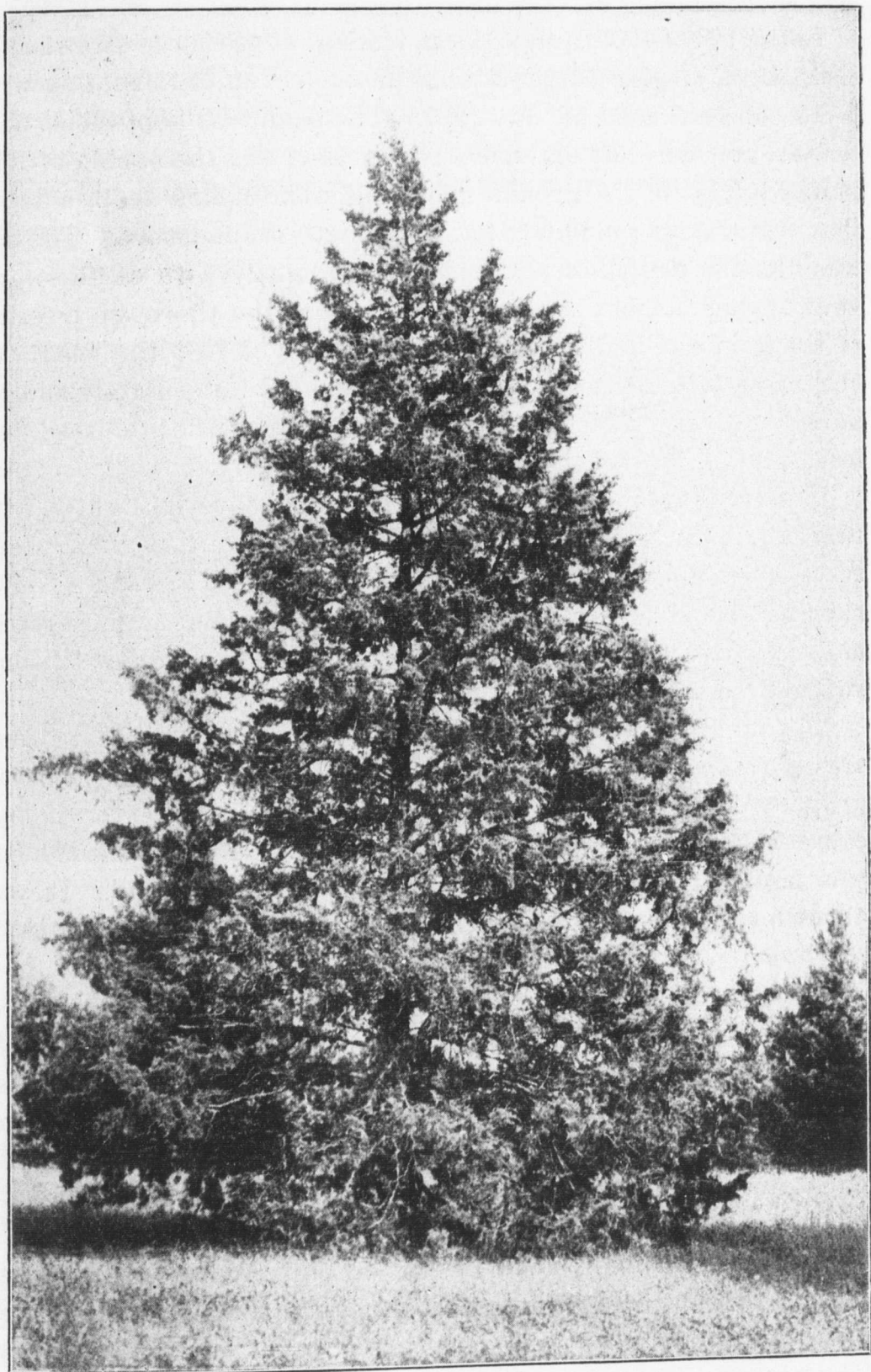
commonly called cedar apple, known to the botanist as *Gymnosporangium macropus*, which fungus also causes the apple rust. It is not the province of this article to discuss this fungus, but where the species is not native and trees introduced are small it is not a

difficult matter to remove the fungus in early spring before the spores which cause the apple rust are formed.

A species that is so generally successful and desirable deserves more attention than has been given it, and it is probable that a much larger number of cedars would have been planted in former years if they had been offered for sale at reasonable prices. There has been a great deal of difficulty in getting a fair proportion of the seed to



grow, nurserymen and planters generally having been compelled for the most part to rely upon young trees found in natural plantings, and these have usually been quite rare. The Horticultural Department of the Kansas Experiment Station has for a number of years been testing methods of treatment of forest tree seeds in order to secure successful germination. Of all the species under observation the red cedar has been the most difficult to grow from seed. Seed treated with lye water or mixed with unleached ashes has germinated more successfully than untreated seed. The same might be said of seed treated by mechanical methods, as rubbing over a grater or with sand to remove the resinous coating which covers the seed. The finding of young cedars beneath trees where birds congregated suggested the feeding of the seed to fowls, but nearly all the seed was digested and only a small part of the seed planted germinated. Planting in a seed bed and caring for it two or three years resulted in better stands,



but the number was still very small. Seed planted at different stages of maturity showed little difference.

In the fall of 1903, quite a large amount of seed was stratified in clean sand, placing a layer of sand in the box and alternating with layers of seed until all was used. The sand was kept moist over winter, and was left out-doors continually. In the spring of 1904 it was buried in the ground about eighteen inches deep, a depth that was thought sufficient to insure continual moisture. The box was lifted in the fall of 1904 and covered lightly with earth to prevent drying out, but not enough to prevent the thorough freezing of the sand and seed. Early in the spring of 1905 the seed was observed to be germinating and was planted immediately and resulted in a very good stand, about eighty per cent of the seed germinating.

The seedling beds have been shaded and covered lightly with sand and a litter of leaves and will be transplanted to nursery rows when the seedlings are one year old. The growth is quite slow for the first two or three years, but after that is more rapid, and trees five or six years old are of such size as to command some respect for themselves.

The cut shows the development from March 20 until May 10 and are approximately natural size. The half-tone is from a photograph taken of one of the oldest cedars now growing on the College campus, a tree that was growing on the ground when the College was moved from Old College Farm to its present site. It was about forty years old when photographed. ALBERT DICKENS.

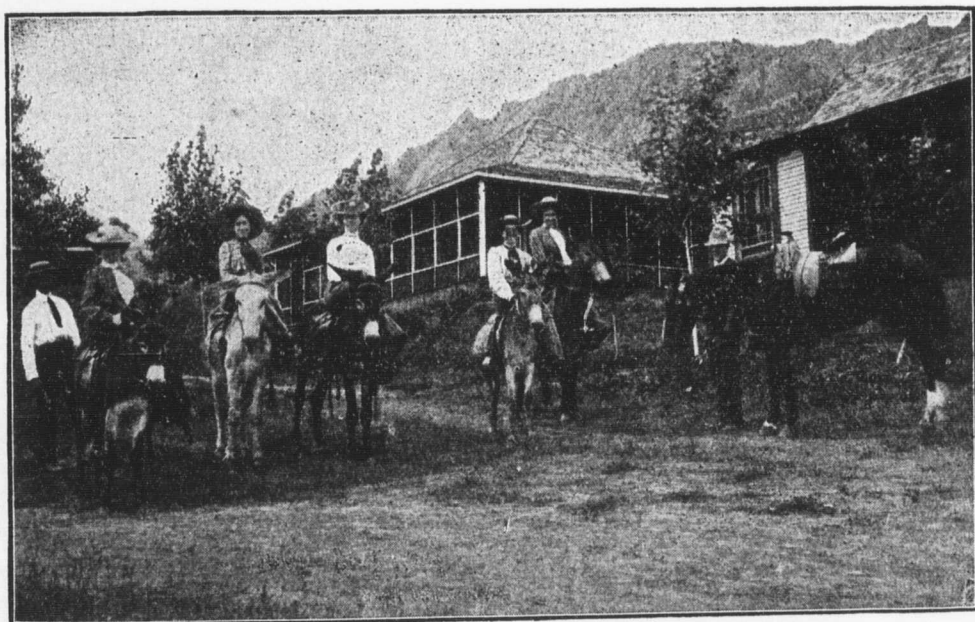
SUMMER VACATIONS.

THE time is at hand for plans to be laid for the summer's vacation. Believing there is no other place possessing so nearly ideal conditions for an outing as the Colorado Chautauqua Assembly, which I attended last year as a lecturer on "Home Architecture," I shall say a few words of the many advantages it offers to students and teachers.

This assembly held its first session eight years ago, and has held one each summer since that time. Its location was selected after examining many of the most noted beauty spots of Colorado. The grounds lie a mile and a half to the south of Boulder, at the terminus of the street railway, on a pine-covered plateau rising at the back of the Rockies. The view from the grounds is one of

inspiring grandeur. The site overlooks the city and miles of the surrounding country of the valley, while the mountains in the rear add their rugged beauty to the scene. The auditorium, with a seating capacity of four thousand, overlooks this picture. It is surrounded on the north and east by stone parapets within which are constructed promenades and broad, rustic seats—a favorite resort for guests to assemble and listen to the out-door band concerts and enjoy the beauties of the natural scenery.

A number of picturesque and comfortable frame cottages are



located on avenues radiating in three directions from the auditorium. These are rented to guests and make a very pleasant summer home in which light housekeeping can be done if desired. For those wishing a more truly camp life, commodious tents, placed on substantial board floors, are furnished. These make very comfortable sleeping quarters and give one all of the advantage of the fresh air, as well as the experience of tenting out among the Rocky Mountains. The tents and cottages can be rented cheap.

The dining hall has a location much like the auditorium. Its spacious verandas on the north and east overlook the city. The dining-room will seat two hundred or more and a large lunch-room is run as an annex.

The school building is a large two-story structure for the use of the summer school classes. The following courses were offered last year: Bible study, primary methods, psychology and peda-

gogy, modern languages, classics, science, literature, physical culture, dramatic expression, voice culture, domestic science, instrumental music, kindergarten, health, art and normal. In addition to these, C. L. S. C. round-table meetings and woman's council



meetings were held. At the close of the session a diploma or certificate of work done is issued to every one taking a full course in any subject. The fees in the summer school are reasonable, ranging from one dollar to twenty-five dollars, according to work selected. This is certainly an ideal way for teachers and students to spend their summer vacation. In addition to the summer

school maintained by the Chautauqua, a summer course is given by the University of Colorado, which is located in Boulder.

The platform program is filled to the brim with high-class attractions from all parts of the country. Professor Rischar's Chicago orchestra of sixteen musicians has again been engaged for the entire session of five weeks. Several talented vocal soloists will also appear, among them being the famous contralto, Miss Zoa Pearl Park, who charmed every one who heard her last year. Another will be the prominent soprano from Chicago, Miss Mary Florence Stevens. Another attraction which will be on duty through the entire session is one of the finest moving-picture machines ever made, that of Mr. H. H. Buckwalter, of Denver, who has a national reputation as a moving-picture man.

Among the prominent names appearing on the program are Frank R. Roberson, the Carolinian Jubilee Troupe, the Roney Boys, known all over the world as royal entertainers; Hendrickson, the well-known magician; Elias Day and wife, characterists; The Dunbar Male Quartette and Bell Ringers; Stewart and Garretson, famous as magicians; Eugene May, a traveler of international reputation; Morphet and Stephenson, a quartette of novelty performers, introducing ventriloquism, magic, musical novelties, etc.; and many other attractions of like character. Every evening will be filled with entertainments of the highest order.

The most delightful diversions of the Colorado Chautauqua are the mountain excursions. Last year a party of thirty took a three-day's trip to the summit of Arapahoe Peak, where the famous Arapahoe glacier was visited. One-day excursions to Boulder Falls, to Castle Rock and to South Boulder Canon form interesting experiences for summer outings.

Nor should the associations at the assembly be overlooked. Last year, at the annual "Rally of the States," persons from twenty-four states and six foreign countries were present, and the party of thirty taking the Arapahoe trip was gathered from twelve different states. This cosmopolitan character of the personnel of the assembly makes an educational feature which can hardly be overestimated.

I believe that there is no place in America where more ideal weather conditions can be expected during the time of the assembly. An altitude of a little more than a mile above sea level and the air from the snow-capped mountain peaks drive away the op-

pressive heat which characterizes this period of the year in lower altitudes. Usually bright sunshiny days are succeeded by cool, invigorating nights throughout the entire session. This fact should appeal to all who seek to escape the heat of southern and eastern summers.

Rev. T. DeWitt Talmage has said of the Colorado assembly: "I have visited every summer camping ground of note, but here is the most perfect camping ground I have ever seen. The time will come when this Chautauqua will attract 100,000 people in a single season, and be without question the greatest intellectual gathering between the Missouri river and the Pacific coast."

The inserted cuts representing a mountain excursion on the down road from Boulder Falls and an excursion party starting from the "Texas Cottage" in the southwest corner of the assembly grounds were made from photographs taken by a friend who attended both excursions with a kodak. J. D. WALTERS.

Y. W. C. A. "Furniture Shower" Commencement Week.

It is the wish of the Y. W. C. A. to furnish a house to serve as a home until such time as they may be able to provide a permanent home of their own. To this end we, the Advisory Committee, ask our friends, especially former students, to bring or send such contributions, large or small, as may be convenient. Anything in the way of furniture, rugs, bedding, linen, dishes or cooking utensils will be gratefully received. Money contributions can be used to best advantage, especially if received soon. Address all communications in regard to the matter to the Secretary of the Committee, or deliver personally all articles at Y. W. C. A. office, Kedzie Hall.

Thanking you in advance for your interest and coöperation, we remain

Very respectfully yours,

ADVISORY BOARD, Y. W. C. A.

MARGARET MINIS, *Secretary*.

ADA RICE, *Chairman*.

The design for the engraving on the Fielding corn trophy, of which a cut appears in this issue, was made by Miss Ella Weeks, of the Architectural Department, and is a fair sample of the high quality work done by Miss Weeks.



The Fieldings' Loving-Cup.

We present in this issue a half-tone cut of the Fieldings' Loving-Cup, presented to the students of the College for efficiency in corn judging, by Geo. T. Fielding & Sons, seedsmen, Manhattan, Kan. This cup is eight and one-half inches in height, and is of solid sterling silver, plated with gold on the inside, with a beautiful design of an ear of corn in the husk engraved on its face.

The cup will be contested for by the classes in the Agricultural courses during four annual contests, the names of the winning teams being engraved on the cup. It was won for the first time, March 4, 1905, by the second-year short-course class, represented by the following students: E. R. Trout, W. W. Goddard, H. L. Burnett, A. D. Perry, and Coy Lupher.

This loving-cup will soon be placed on exhibition in the College Library, where it will permanently remain as a memorial to the successful contestants and to the corn-judging work at K. S. A. C.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83]. Pres.....Jewell City
HON. J. O. TULLOSS ['99]. Vice-Pres.....Sedan
HON. J. S. McDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

Died, Friday, May 26, the four-months-old daughter of Prof. and Mrs. C. M. Brink.

The junior girls entertained the senior girls Wednesday afternoon from 3:30 to 5:30 with a tea party.

Senior-junior, sophomore-freshmen and senior-faculty baseball games, receptions, etc., are coming thick and fast these days.

The fastest game the College team has played this year came off at the Athletic Park on May 26, when our boys beat the Highland Park team 5 to 0.

The campus has been mowed, producing an excellent crop of hay. The second growth, fragrant, green, and velvety, will be in its Sunday clothes on Commencement.

Capt. Pearl M. Shaffer will present a fine gold-headed cane to the captain who has the best drilled company of cadets. Competitive drill will take place on Commencement day.

Memorial day was properly observed at Manhattan. As usual, the College was represented in the annual procession to the cemetery by the cadet band and the College battalion, who were out in full force and full dress.

Married, Thursday, June 1, Assistant Chas. Melick, of the Dairy and Animal Husbandry Department, and Miss Gertrude Anderson, of Lincoln, Neb. The INDUSTRIALIST congratulates the happy couple in their union and wishes them a long life of continuous bliss and prosperity.

Captain Schaffer and the cadet officers of A company were served with an army supper at the Manhattan Candy Kitchen Monday evening. The first course was hardtack, baked beans, Southern sandwiches, coffee; second course, brick ice-cream, moulded in colors of the flag, wafers and ice-cream candies.

The railroads have granted a rate of one and one-third fare for the round trip from all points in Kansas and including Kansas City and St. Joseph, Mo., on the certificate plan to attend the Commencement exercises and triennial alumni reunion. Tickets on sale June 10 to 14, good returning till June 19. Be sure and take a certificate for each ticket purchased coming. These, when signed by Professor Dickens, will enable you to obtain return ticket at one-third fare.

The senior class book is nearly completed, and, with its many interesting and spicy write-ups, promises to be the best of its kind ever gotten up during the history of the College. Over 350 copies have been subscribed for.

The Western Electric Company, of Chicago, writes that it has places for two of the electrical engineering graduates. For the first six months it offers the students 20 $\frac{1}{4}$ cents per hour, and for the next six months 27 $\frac{3}{4}$ cents, after which full wages, according to position, will be paid. Henry Hess and George Wolf will accept positions with the company.

The twenty-ninth session of the Riley County Normal Institute will be held in the Manhattan Central School building. Monday, June 5, will be given to enrolment at the county superintendent's office. All lessons as outlined will be recited Tuesday. The examinations for applicants for teachers' certificates will be held Friday and Saturday, June 30 and July 1, immediately following the institute.

Prof. D. E. Lantz returned from Washington, D. C., last week. He looks robust and bright and says that Washington water agrees with him. He came West to make some experiments with coyote fences and to look up a number of other things pertaining to his special line of investigation. Secretary Wilson has ordered the organization of a new bureau by July 1, and has designated the professor as its head.

The *Kansas Agricultural Review* is a new monthly publication by the agricultural students of the College. The first number, issued May 18, is a neatly printed magazine of thirty-two pages, with colored cover and advertising pages. It contains articles by Professors TenEyck, Erf, Barnes and Willard, and is full to the brim with bright news of an agricultural or general character. A special rate of 50 cents a year is offered to all who subscribe before September.

The annual reception in honor of the graduating class took place last Wednesday evening at the new home of Pres. and Mrs. E. R. Nichols, assisted by Prof. and Mrs. J. D. Walters, Prof. and Mrs. B. L. Remick, Prof. and Mrs. E. B. McCormick, Prof. and Mrs. B. F. Eyer, Prof. and Mrs. J. E. Kammeyer, Prof. Henrietta W. Calvin, and Mrs. Arnold Emch, of Boulder, Colo. The class colors, old rose and white, were carried out in the decorations of the rooms and the refreshments. All report a good time.

W. J. Wilkinson, senior in the architectural course, has accepted a position as draftsman with Architect Berlinghoff, of Beatrice, Neb., at fifty cents per hour for all work. Being practically through with his studies, he went to Beatrice two weeks ago to start his work, but returned last Wednesday to finish up his thesis. He will leave again the day after Commencement. Wilkinson is a fine draftsman and we congratulate him on his opportunity to work with an architect of such a reputation.

Professor Walters has received a package of thirty-six original drawings from the K. S. A. C. Club in Washington, D. C. The drawings represent members of the Faculty of this College and were made last winter at one of the meetings of the club, when every one present was given a piece of drawing paper and a pencil and required to draw the picture of his favorite professor. The pictures are variegated as to the degree of art displayed, but they are easily recognized, notwithstanding the many exaggerations of ears, noses, whiskers, bald heads, hump shoulders, etc. The professor will present them to the State Historical Society for the information of coming generations of Kansans as to how the early K. S. A. C. scientists looked.

The United States Department of Agriculture issues a monthly list of publications for the information of farmers and others. In the issue for April, 1905, we find the following publications whose authors were formerly connected with the Kansas Agricultural College: "Information Concerning Milch Goats," by George Fayette Thompson; "Coyotes in Their Economic Relations," David E. Lantz; "North American Species of *Agrostis*," A. S. Hitchcock; "Copper as an Algicide and Disinfectant in Water supplies," Karl F. Kellerman; "United States and State Standards for Dairy Products," Ed. H. Webster; "Report on the Gipsy Moths and Brown Tail Moths," C. L. Marlatt. There are more than fifty people in Washington who were formerly connected with the Kansas Agricultural College, though some of those included in this count are married ladies whose husbands only are employed by the Government.—*Kansas Farmer*.

Andrew Carnegie's ten million dollar pension fund for superannuated college professors has brought forth much comment from professors of state institutions. Many have expressed themselves as glad that the gift does not extend to state institutions, which are excluded from the benefit fund. Dr. J. E. Pope, professor of economics of the Missouri State University, in a lecture before one of his classes, declared that in the long run professors would derive little if any financial benefit from the pension fund. Doctor Pope assigns the following reasons for this view: The colleges will capitalize the pension fund. They will hold out the prospect of a pension in the future as an excuse for refusing to raise salaries in the present. Much that is added in the form of pensions will be neutralized by diminished salaries. The managements of colleges, rather than the professors themselves, will gain. Of course, the professors will gain indirectly through the increased prosperity of the colleges, but this indirect gain will be not at all commensurate with the income from the pension fund, which is really, in the long run, not much different from an outright endowment of the colleges. Professor Walters, the senior of the Faculty of this College, holds that the only parties benefited by the gift are the present old members of the profession who would soon be ready to receive the pension. He coincides with Professor Pope, that the younger teachers will not receive much direct benefit from the bequest.

Civil service examinations for a number of positions are to be held two dates in June. The first day is June 7. Following are the places to be filled: Repairman, weather bureau, East Clallam, Wash., \$720 a year; must have had experience. Marine fireman for steamer Cartwright, Seattle, Wash., only physical test, \$540 a year. Artist draftsman, geological survey, \$1200 a year. Wheelwright, Kansas Pottawatomie Indian agency, \$720 a year; no educational test. Expert veloc printer, geological survey, \$1200 to \$1400 a year; experience. Assistant veloc printer, geological survey, \$900; experience. Cable foreman and assistant cable foreman, signal service points throughout the country, including on board ships, Burnside on Alaskan coast, Field on Atlantic coast, Ingalls at Manila, P. I.; stations liable to change; \$55 to \$90 a month. Matrons Indian service, \$400 to \$720 a year. On June 14 there will be examinations for the following places: Scientific assistant, department of agriculture, \$600 a year; strict examination. Assistant, section of illustrations, department of agriculture, \$840 to to \$1200 a year. Inquiries should be addressed immediately to the civil service commission, Washington. For all the positions of both days the examinations will be held at Fort Scott, Salina and Wichita.

ALUMNI AND FORMER STUDENTS.

H. F. Butterfield and Florence (Vail) Butterfield, both of the class of 1901, are visiting the home folks here for a few weeks.

Dr. S. L. Van Blarcom, '91, and Miss Kate Stingley were married in Manhattan at twelve o'clock, May 25. They will reside in Kansas City, Kan.

Junie Parks, '98, who has been teaching in Riley county since her graduation, left last week with her sisters, Leila and Clara, for their new home in Oklahoma, where their parents have been since February. Their address is Hominy, Okla.

Bulletin No. 70 of the Bureau of Animal Industry on the "Milk Supply of Twenty-nine Southern Cities" is by C. F. Doane, '96. It is a report upon a special investigation of the milk supply of the southern cities, taken up because of certain conditions found to exist in that region. Mr. Doane performed this work as a special agent, being still professor of dairy husbandry and bacteriology in the Maryland Agricultural College.

We have received from D. W. Working, '88, superintendent of schools of Arapahoe county, Colo., a copy of his address on "The Work of School Directors" delivered at Littleton, Colo., May 3, 1905, before a meeting of members of school boards. Mr. Working takes a common-sense position on this subject. Mr. Working is also secretary of the Third District Normal Institute, which will hold sessions this month in Denver.

During the past year the Dairy and Animal Husbandry Department of the Kansas Experiment Station has made a number of tests showing the necessity of nitrogenous feed in connection with carbonaceous. Bearing on this question an experiment was conducted to compare corn-meal and soy-beans with corn-meal alone. Hogs were fed twenty-eight days on this ration during the fattening period. The following table gives the results:

CORN-MEAL AND SOY-BEAN MEAL.				
	Pounds fed.	Value per ton.	Value.	Cost of 100 lbs. Gain.
Corn-meal.....	1684.4	\$12.50	\$10.52	.....
Soy-bean meal.....	421.6	25.00	5.27	.....
Total.....	.....	.....	\$15.79	\$3.90
CORN-MEAL ALONE.				
Corn-meal.....	2256	\$12.50	\$14.10	\$4.55

The cold, dry spring has caused early grains to start slowly, but the weather has been especially favorable for the stooling of grain. Winter wheat at the Kansas State Agricultural College has stoolled very abundantly, being too thick, as a rule. Early-sown oats and barley cover the ground at this date, and there is a promise of a heavy crop of all kinds of small grain, provided the season remains favorable.

The Printing Department of the Kansas State Agricultural College has been kept quite busy of late. With the issuing of three stated publications—*The INDUSTRIALIST*, *The Students' Herald*, and *The Jayhawker*—together with the ever-increasing work for the College departments, the societies, classes, associations, mailing of bulletins, etc., with inadequate equipment and room, the department is kept busy ten hours per day. This is one of the departments that "keeps busy" fifty-two weeks during the year.

Miss Ula Dow, who will be graduated from the domestic science course of the Kansas State Agricultural College this month, will conduct the domestic science department of the Lincoln Park Chautauqua, at Cawker City, Kan., August 6, to 13, 1905. This is not only a recognition of the personal worth of Miss Dow, but also of the standing of this department of the Agricultural College, where domestic science and household arts have been taught for nearly thirty years, and with constantly increasing facilities and efficiency.

The Experiment Station gardens of the Kansas State Agricultural College have been making some quick returns from early vegetables. Radishes were ready for market twenty-one days after planting. Garden peas planted March 12 furnished a very fair yield of marketable peas May 19. Spinach planted March 12 furnished a good quality and profitable quantity. Some lettuce sown in the fall and protected by a cover of leaves and a cold frame was of sufficient size for the table March 28, and gave very fine marketable heads April 15.

VOL. 31

NO. 37

THE INDUSTRIALIST

ISSUED WEEKLY BY

**KANSAS STATE
AGRICULTURAL COLLEGE**

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

BOARD OF INSTRUCTION

ERNEST R. NICHOLS, A. M. (University of Iowa).....	President
JOHN D. WALTERS, M. S. (K. S. A. C.).....	Professor of Architecture and Drawing
JULIUS T. WILLARD, M. S. (K. S. A. C.).....	Professor of Chemistry
EDWIN A. POPENOE, A. M. (Washburn).....	Professor of Entomology and Zoölogy
BENJ. L. REMICK, Ph. M. (Cornell College).....	Professor of Mathematics
BENJ. F. EYER, B. S. (Armour Inst. of Tech.).....	Prof. of Physics and Electrical Engineering
HERBERT F. ROBERTS, A. B. (U. of K.), M. S. (K. S. A. C.).....	Professor of Botany
WILLIAM A. MCKEEVER, Ph. M. (Univ. of Chicago).....	Professor of Philosophy
EDMUND B. MCCORMICK, S. B. (Mass. Inst. Tech.).....	Prof. of Mech. Engineering, Supt. of Shops
ALBERT DICKENS, M. S. (K. S. A. C.).....	Professor of Horticulture, Supt. of Grounds
CLARK M. BRINK, A. M. (U. of R.), Ph. D. (Univ. of City of New York)...	Professor of English
ALBERT M. TEN EYCK, B. Agr. (Wisconsin).....	Professor of Agriculture, Supt. of Farm
MRS. HENRIETTA W. CALVIN, B. S. (K. S. A. C.).....	Professor of Domestic Science
RALPH R. PRICE, A. M. (U. of K.).....	Professor of History and Civics
JULIUS E. KAMMEYER, A. M. (Central Wesleyan College).....	Professor of Economics
OSCAR ERF, B. S. Agr. (Ohio University).....	Professor of Dairy and Animal Husbandry
PEARL M. SHAFFER, Captain Twenty-fifth Infantry, U. S. A.....	Professor of Military Science
JOHN V. CORTELYOU, A. M. (Univ. of Neb.), Ph. D. (Heidelberg).....	Professor of German
OLOF VALLEY, B. M. (Chicago Conservatory).....	Professor of Music
F. S. SCHOENLEBER, M. S. A. (Ia. State Ag. Coll.), D. V. S. (Chicago Vet. Coll.).....	Professor of Veterinary Science
JOSHUA D. RICKMAN, (I. T. U.).....	Superintendent of Printing
BENJ. S. MCFARLAND, A. M. (Miami).....	Principal Preparatory Department
MISS MARGARET J. MINIS, B. S. (K. S. A. C.).....	Librarian
MISS MARGUERITE E. BARBOUR (Sargent Nor. Sch. Phys. Tr.),	Director of Physical Training
MISS FRANCES M. BARNES (Clarkson School of Tech.).....	Superintendent of Domestic Art
MISS LORENA E. CLEMONS, B. S. (K. S. A. C.).....	Secretary
JACOB LUND, M. S. (K. S. A. C.).....	Superintendent Heat and Power Department
MISS ALICE RUPP, (Indiana State Normal), A. M. (K. S. A. C.),	Assistant Professor of English
CLARENCE L. BARNES, D. V. M. (Cornell University).....	Asst. Professor of Veterinary Science
JOHN O. HAMILTON, B. S. (Chicago).....	Assistant Professor of Physics
OSCAR H. HALSTEAD, B. S. (K. S. A. C.).....	Assistant Professor of Mathematics
ROLAND J. KINZER, B. S. Agr. (Iowa State Col.).....	Assistant Professor of Animal Husbandry
ANDREY A. POTTER, S. B. (Mass. Inst. Tech.).....	Asst. Professor of Mechanical Engineering
Miss Ada Rice, B. S. (K. S. A. C.).....	Instructor in English
Walter E. Mathewson, B. S. (K. S. A. C.).....	Instructor in Chemistry
Frank M. McClenahan, A. M. (Yale).....	Instructor in Chemistry
William L. House.....	Foreman of Carpenter Shop
Robert H. Brown, B. M. (Kan. Con. of Music), B. S. (K. S. A. C.)...	Assistant in Music
William Anderson, B. S. (K. S. A. C.).....	Assistant in Physics
Miss Gertrude Barnes.....	Assistant Librarian
Louis Wabnitz.....	Foreman of Machine Shops
Miss Ina E. Holroyd, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Hetty G. Evans, (Mass. Normal Art School).....	Assistant in Drawing
Vernon M. Shoosmith, B. S. (Mich. Agr. Coll.).....	Assistant in Agriculture
Ambrose E. Ridenour, B. S. (K. S. A. C.).....	Foreman in Foundry
Geo. A. Dean, B. S. (K. S. A. C.).....	Assistant in Entomology
Miss Emma J. Short.....	Assistant in Preparatory Department
Miss Ina Cowles, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Miss Maud Coe, B. S. (K. S. A. C.).....	Assistant in Domestic Art
Roscoe H. Shaw, B. S. (N. H. C. A. & M. A.).....	Assistant Chemist, Experiment Station
Theo. H. Scheffer, A. M. (Cornell University).....	Assistant in Zoölogy
Miss Kate Tinkey.....	Assistant Librarian
Earl N. Rodell, B. S. (K. S. A. C.).....	Assistant in Printing
Miss Caroline Hopps, Ph. B. (University of Chicago).....	Assistant in English
Miss Helen Thompson, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Ella Weeks, A. B. (U. of K.).....	Assistant in Drawing
Miss Flora Rose (Framingham Mass. Normal).....	Assistant in Domestic Science
Miss Clara Pancake, B. S. (K. S. A. C.).....	Assistant in Domestic Science
R. F. Booth, B. S. (Northwestern).....	Assistant in Mathematics
Geo. C. Wheeler, B. S. (K. S. A. C.).....	Assistant in Feeding Experiments
Robert E. Eastman, M. S. (Cornell University).....	Assistant in Horticulture
Miss Daisy Zeininger, B. A. (Fairmount).....	Assistant in Mathematics
Roy A. Seaton, B. S. (K. S. A. C.).....	Assistant in Mathematics
Hernon C. Kyle, B. S. (K. S. A. C.).....	Assistant in Agriculture
George F. Freeman, B. S. (Ala. Polytech. Inst.).....	Assistant in Botany
M. Francis Ahearn, B. S. (Mass. Ag. Coll.).....	Foreman of Greenhouses
Fred C. Nicholson.....	Foreman of Blacksmithing
Chas. S. Dearborn, B. S. (K. S. A. C.).....	Assistant in Mechanical Engineering
Miss Cecilia Augspurger.....	Assistant in Music
Charles W. Melick, B. S. (Neb.).....	Assistant in Dairy Husbandry
Robert J. Foster, D. V. M. (Cornell).....	Assistant in Veterinary Science
Miss Alice Loomis, B. S. (K. S. A. C.).....	Assistant in Preparatory Department
Miss Alice M. Melton, B. S. (K. S. A. C.).....	Clerk in Director's Office
Miss Sarah Hougham, B. S. (K. S. A. C.).....	Clerk in Botanical Department
Charles Hughes.....	Secretary to the President
William R. Lewis.....	Janitor

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., JUNE 10, 1905.

No. 37

A RETROSPECT.

THE College year drawing to a close has been one of the most satisfactory in the history of the College—a year of work and growth and good results. It witnessed the construction and completion of the Auditorium, the removal of the Dairy Department to its new quarters in Dairy Hall, the building of a large addition to the mechanical work-shops, the inauguration of a course in architecture, the organization of a course in veterinary science, the raising of the requirements for admission to the regular College courses, the inauguration of the revised course of study published in the catalogue of '04, the inauguration of a summer school of domestic science, and the completion of lesser improvements and betterments almost too numerous to mention.

THE BOARD OF INSTRUCTION.

For the Faculty the year now drawing to a close has been a very busy one. There have been very few changes made in the teaching force during the past two or three years, which is a proof that the right men and the right women are behind the teachers' desks. The year has been one of peace and good-will. At no time in the history of the College have the professors and assistants agreed better and were united better in every question of policy or discipline. Two or three months ago a few misinformed local papers tried to magnify a case of discipline concerning three junior students into a regular revolt on the part of the student body, but good sense prevailed among the young men and young women and there never existed a better feeling among the whole large College family than now.

The Board of Instruction is divided for administrative purposes into the Faculty and assistants. The Faculty is made up of the heads of departments—the President, 19 professors, 2 superintendents, 1 principal, 1 librarian, and 1 director. There are 7 assistant professors, and 44 assistants, clerks, and other officers,

a total of 76 regular employees. In addition to these the different departments employ a number of student assistants for more or less regular work in instruction, preparation of experiments, collecting and labeling.

THE STUDENTS.

Whatever a college may do concerning its buildings and equipments, however it may pride itself with its scientific achievements and its shop and field experiments, the main product of its efforts is the student, his number, standing, and work. The Kansas State Agricultural College has always believed in this, and has for this reason become the largest agricultural college in the world and the most characteristic institution of the State. The forthcoming catalogue for 1904-05 will enumerate an annual attendance of 1463 students; that is, 993 men and 470 women. Of these, 500 are members of the preparatory course, 289 are freshmen, 198 sophomores, 122 juniors, and 117 seniors. The graduating class will number over 100, the first class in the history of the College overreaching the hundred mark.

In this number, 98 counties of the State and 5 other states are represented. Only 7 counties have had no representatives at College, and these are in the thinly settled part of the western end of the State. A comparison with the last catalogue will show a slight reduction of students, which may be explained by referring to two or three facts: First, the discontinuing of the apprentice course, which last year furnished 78 names and this year but 14; second, the incidental fee of \$3 per term forced upon the College by the legislature of 1903. For students from beyond the border of the State this fee is \$10 for matriculation and \$30 for the three terms, or a total of \$40 for the first year. In former years the College had large numbers of students from other states. Last year 11 states sent 26 students; the previous year 21 states sent 88; in 1897-'98, fourteen states sent 32; but the fee stated above has been almost prohibitive for this class of students, there having been but five students from other states this year.

Another cause must be looked for in the raising of the standard of admission, adopted by the Board at their June meeting last year and put in effect last fall. The College now requires a whole year of high-school or special preparatory work of the entering freshman, a provision that will greatly increase the effectiveness

of the work of the first-year classes, and cumulatively that of the higher classes.

"BY THEIR FRUITS YE SHALL KNOW THEM."

The alumni and ex-students of the Kansas State Agricultural College are succeeding wherever they go—on the farm, in the shop, in the editorial chair, or—when they hail from the Domestic Science Department, in the most important position in the land, that of the practical and sensible mother and housekeeper.

The roster of bureau chiefs and specialists of the United States Department of Agriculture reads like an alumni catalogue of this College. A story is told of a visitor interested in agriculture who had spent several days in the department. He had been pretty generally introduced, and when the tenth person had informed him he came from the Kansas Agricultural College, the visitor remarked: "Are all the jobs in the department reserved for graduates from that institution?" There are some six or eight ex-professors from Manhattan who have important positions as heads of various bureaus, but the list of Manhattan graduates is even more formidable. A few names may have been overlooked in the following list of the Kansas Agricultural College graduates now employed by the government in the Agricultural Department: George H. Failyer, scientist, bureau of soils; Charles L. Marlatt, entomologist, in charge of experimental field work; Mark A. Carleton, cerealist, in bureau of plant industry; David G. Fairchild, agricultural explorer; Julia R. Pierce, assistant in the soil survey, bureau of soils; Walter T. Swingle, physiologist, bureau of plant industry; George L. Clothier, assistant forest inspector; Charles P. Hartley, assistant in bureau of plant industry; J. B. Norton, assistant in bureau of plant industry; J. M. Westgate, assistant in bureau of plant industry; E. C. Butterfield, assistant in bureau of plant industry; William L. Hall, assistant forester in charge of forest extension, bureau of forestry; Z. L. Bliss, assistant forest expert, bureau of forestry; A. E. Oman, assistant forest expert, bureau of forestry; L. A. Fitz, assistant in bureau of plant industry; A. H. Leidigh, assistant in bureau of plant industry; E. R. Secrest, assistant forest expert, bureau of forestry; H. B. Holroyd, assistant forest expert, bureau of forestry; R. A. Oakley, expert agrostologist, bureau of plant industry; George F. Thompson, editor, bureau of animal industry; R. S. Kellog, expert, bureau of forestry.

In other positions in Washington from this College are: W. R. Spilman, superintendent of rural delivery of the Post-office Department; Lewis W. Call, chief clerk of the advocate-general's office, War Department; E. M. S. Curtis, rate clerk of the general passenger office of the Southern Railway Company. The Agricultural College has the right to point with pride to such a list of names.

EXPERIMENT STATION.

The Experiment Station of the Kansas State Agricultural College is a separate department of the institution, directed by a council of professors which consists of the President of the College, as *ex-officio* chairman, and the professors of Chemistry, Botany, Entomology, Veterinary Science, Agriculture, Horticulture, and Animal Husbandry. Prof. J. T. Willard, of the Chemical department, is the general director of the Station work. The Station was organized in 1888 and has published during the seventeen years of its existence 129 regular pamphlet bulletins, detailing the results of its work. There were also published 140 press bulletins and seventeen annual reports. The organic act provides "That bulletins or reports of progress shall be published at least once in three months, one copy of which shall be sent to each newspaper in the State in which they are respectively located, and to such individuals actually engaged in farming as may request the same, and as far as the means of the Station will permit." In accordance with this law there were distributed last year over 125,000 copies of the regular bulletins.

The following is a list of the pamphlet bulletins published since July 1, 1904.

- No. 124, Experiments in feeding steers and in breeding pigs.
- No. 125, Experiments with Dairy cows.
- No. 126, Experiments with hand-fed calves.
- No. 127, The roots of plants.
- No. 128, Fort Hays Branch Experiments, 1902-'04.
- No. 129, Kansas mammals in their relation to agriculture.

Of press bulletins the following have been issued during the fiscal year.

- No. 132, Garden mole.
- No. 133, Grasshopper poison.
- No. 134, Baby beef.
- No. 135, Ringbone and spavin.
- No. 136, Contagious abortion in cattle.
- No. 137, Some troubles of swine.
- No. 138, Testing seed-corn for vitality.
- No. 139, Garget.
- No. 140, Kansas Station egg-laying contest.

The manuscript for four bulletins is in the hands of the printer or ready to go to the printing-office, and several additional subjects are being worked up and their results tabulated for publication during the coming summer or fall. Space does not permit here of speaking at length of the work of the experiment Station. We will remark, however, that the constantly increasing requests for the published literature is a gratifying indication that the people of the State are appreciating the efforts made at this College to assist the practical farmer and stockman with carefully conducted experiments and correct scientific observation and generalization. Much of the work of the Station is unusually laborious because field experiments require the corroboration of several seasons before the results can be trusted. In a laboratory experiment, the manipulator can control the conditions to such an extent that a single test will usually determine the existence or non-existence of an anticipated fact; but in the field, the ever-varying conditions of rainfall, wind, frost, drouth, insect pests, rust, etc., cannot be controlled or eliminated so as to give in a single season all the required data for the conclusions sought.

FARMERS' INSTITUTES, 1904-'05.

The following summary statement, furnished us by Prof. J. T. Willard, chairman farmers' institute committee, shows the institutes held during the current fiscal year, their dates and the names of the speakers from the College who assisted, and the estimated attendance.

Abilene	Nov. 4, 1904.....	Ten Eyck.....	200
Altamont.....	Nov. 18-19, 1904,	Ten Eyck.....	120
Anthony	Nov. 15-16, 1904,	Kinzer, Dickens, Mrs. Calvin...	225
Arkansas City	Feb. 13-14, 1905,	Erf, Eastman.....	250
Belleville.....	Feb. 20, 1905.....	Erf, Shoesmith.....	50
Berryton.....	Jan. 18-19, 1905,	Ten Eyck, Popenoe.....	300
Blue Hill	Nov. 2, 1904.....	Dickens, Kinzer	210
Bucklin	Mar. 1-2, 1905...	Erf, Eastman	225
Burlingame.....	Aug. 18, 1904....	Ten Eyck.....	50
Burton.....	Feb. 10-11, 1905,	Erf, Eastman.....	80
Cadmus.....	July 21, 1904....	Dickens, Miss Minis.....	800
Caldwell.....	Dec. 7-8, 1904....	Popenoe, Wheeler.....	120
Canton.....	July 16, 1904....	Ten Eyck, Mrs. Calvin.....	50
Courtland.....	Feb. 21, 1905....	Erf, Shoesmith.....	225
Denison.....	Sept. 29-30, 1904,	Shoesmith, Mrs. Calvin	400
Dole's Park.....	Aug. 20, 1904....	Roberts, Miss Minis.....	400
Edgerton.....	Feb. 16-17, 1905,	Mrs. Calvin, Willard.....	475
Excelsior.....	Nov. 3, 1904....	Dickens, Kinzer.....	150
Garden City.....	Dec. 19-20, 1904,	Haney.....	100
Garrison.....	Sept. 2, 1904....	Mrs. Calvin, Ten Eyck	250
Girard	Oct. 7-8, 1904....	Ten Eyck, Willard	145
Hackney	Dec. 8-9, 1904...	Popenoe, Wheeler.....	350
Haskell	July 13, 1904....	Ten Eyck.....	100
Hiawatha	Jan. 12-13, 1905,	Miss Rose, Ten Eyck.....	165

Highland Station ..	Aug. 25, 1904....	Popenoe.....	150
Higgins' Grove	Sept. 16, 1904....	Mrs. Calvin, Willard.....	175
Holton	Oct. 21, 1904....	Popenoe, Dickens.....	35
Hutchinson.....	Feb. 1-2, 1905....	Dickens, Barnes.....	50
Indian Creek.....	Nov. 17-18, 1904,	Shoesmith, Mrs. Calvin.....	250
Ingalls.....	Sept. 10, 1904....	Mrs. Calvin, Dickens.....	200
Jewell.....	Nov. 21, 1904....	TenEyck, Willard.....	300
Leavenworth.....	Oct. 20, 1904....	Mrs. Calvin.....	150
Lewis.....	Feb. 2-3, 1905....	Dickens, Barnes.....	340
Lincoln.....	Feb. 17, 1905....	Dickens.....	...
Michigan Valley...	Aug. 17, 1904....	TenEyck.....	150
Oak Grange.....	Dec. 14-15, 1904,	Mrs. Calvin, Popenoe.....	180
Oneida.....	Feb. 22-23, 1905,	TenEyck, Erf.....	170
Paxico.....	Feb. 18, 1905....	Wheeler, Eastman.....	50
Paxico.....	Apr. 15, 1905....	Kyle, Eastman.....	25
Peabody.....	Feb. 16-17, 1905,	Barnes, Erf.....	150
Randolph.....	Aug. 24, 1904....	TenEyck, Walters.....	300
Randolph.....	Feb. 28, 1905....	Willard, Wheeler.....	60
Richmond.....	Aug. 31, 1904....	Willard, TenEyck.....	200
Rome.....	Feb. 21-22, 1905,	Roberts, Walters.....	380
Rush Center	Aug. 10, 1904....	TenEyck.....	200
Sedan.....	Feb. 14, 1905....	Erf.....	60
Seneca.....	Jan. 26-27, 1905,	TenEyck, Popenoe.....	250
Silver Lake.....	Aug. 11, 1904....	Dickens, Willard.....	80
Stockton.....	Jan. 24-25, 1905,	Mrs. Calvin, TenEyck.....	500
Summerfield	Feb. 2-3, 1905....	Mrs. Calvin, Dean.....	40
Summerfield.. ..	Aug. 31, 1904....	Roberts, Mrs. Calvin.....	100
Tampa.....	Nov. 15, 1904....	Walters, TenEyck, Kinzer.....	235
Wakefield.....	Oct. 7-8, 1904....	Shoesmith, Dickens, Kinzer....	350
Waverly.....	Oct. 20-21, 1904,	Roberts.....	90
Yorktown.....	Nov. 4, 1904....	Dickens, Kinzer.....	125

In addition to the above Professor Erf accompanied a special train, provided by the St. Joseph and Grand Island Railway, which visited a number of towns along that road. Exhibits bearing on dairy topics were carried on the train, and lectures were given by Professor Erf and others. College and Station officers have also assisted at meetings of various other organizations of an agricultural nature.

THE ADDITION TO THE SHOPS.

The new \$5000 addition to the group of buildings that are the home of the department of Mechanical Engineering is completed and ready for occupation. It forms a two-story cross wing at the north end of the main engineering building and is built in the same substantial style of architecture. Its lower floor will be occupied by a part of the machinery of the wood-working and pattern-making divisions, and its upper floor will be used as a drafting-room for the engineering classes. The floors of the building are unusually solid so as to prevent vibration. The rooms are well lighted from all four sides, and the roof is covered with tin shingles. There has also been built a new blue-print room with stationary track and flat-car printing frame.

Of other improvements in and about the shops we may mention the rearrangement of the blacksmith-shop, the addition of a power forge, and the leveling and covering of the rear yard with cinders. A large amount of apparatus and machinery has been installed. A cement block machine has been received as a present by its manufacturers and has been put to test. The power plant has added a new boiler of about 150 horse-power; it has also completed the tunnel system commenced three years ago, connected the Auditorium with the heating plant and provided it with radiation.

THE WATER PLANT.

Last summer the College built a separate water-works system at the cost of over \$10,000, after having used Manhattan city water over fifteen years at an expense of about \$1200 per year, and is now enjoying a bountiful supply of a clear, hygienic and much softer water than formerly. The College is using about 20,000 gallons per day the year around and the problem of a sufficient supply was not an easy one to solve, nor was it an easy matter to sink a well and place a working pump system in the quick-sand stratum that furnishes the water. but Engineer Lund persevered and made it a success in every particular. The pump of the plant is driven by an electric motor, supplied by the dynamo in the power plant. It is of the Dean pattern and has a capacity of one hundred twenty gallons per minute. The tank has a capacity of one hundred thousand gallons and a height above the ground where it stands of one hundred twenty-eight feet. Its depth is twenty-eight feet and its diameter twenty-two feet. The tank being considerable higher than the reservoir of the city, the water pressure is much increased and the usefulness of the water system in case of a fire improved. It may be remarked with just pride that the plant was planned and built by an alumnus of the College, Mr. George Hopper, of Arkansas City, Kan.

THE PRINTING OFFICE.

The College print-shop is one of the busiest parts of the institution. Superintendent Rickman has fully sustained his good name as a "worker" during the year by making several improvements and issuing regularly the three College publications, namely the weekly INDUSTRIALIST, the weekly *Students' Herald*, and the monthly *Jayhawker*. The department has also mailed the Experiment Station pamphlet bulletins and printed and mailed the press

bulletins. Over 125,000 copies of the Experiment Station publications were mailed during the year. Beside this regular work, the print-shop has turned out a large amount of job printing for the Executive office, the different College departments, and the College societies and associations.

BARNs AND SHEDS.

The Dairy and Animal Husbandry Department made a strong effort the past year to provide sufficient pens, sheds and stables for the growing herds of thoroughbred animals in its care. The northeast plot of the College quarter-section, occupied by this department, has undergone a complete transformation during this short period. Three cattle barns, each measuring about 26 by 64 feet, with well-lighted and warm stalls below and haylofts above, have been built and several swine sheds have been constructed. Another barn, measuring about 32 by 100 feet, is going up at present and will be completed before July. A hennery, consisting of a substantial shed divided into ten apartments, with an equal number of pens attached, has been constructed for a home of the "helpful hen." All of these improvements are solidly and yet economically built of good lumber, all have good stone foundations and shingle roofs, all are neatly painted and of pleasing exterior. The pens are built of heavy oak or cedar posts and Page woven wire. Watering troughs or hydrants have been provided for all pens, gates of modern construction have been built—in short, this part of the College farm, for the first time in its history, begins to look like a model worthy to be copied by our farmer friends, and Professor Erf certainly deserves credit for his efforts.

THE COLLEGE ALL RIGHT.

Our space does not permit the mentioning of all the many items of progress and growth that might interest the friends and patrons of the College. We will simply say that the institution is in good working order and ready for another year of increased effort. The last legislature has done well by us. They have not given us what we asked for, nor what we could have used to good advantage, but they provided us with means for additional growth, such as a new Horticultural Hall, new green-houses, a new seed barn, coal from the State penitentiary mines, additional boilers and boiler room, and a fair appropriation for running expenses. The next year will witness the organization of a course of study in

veterinary science, the full development of the new course in architecture, and many other things too numerous to mention. The past of the Kansas State Agricultural College has been glorious—the future will be grand.

The writer of this has often wished of late that Pres. John A. Anderson (1873-'79), who changed the institution from a classical college to an agricultural and mechanical school, including domestic science, and whose belief in modern education was the beacon-light of every one of his acts and experiments, might come back for a day to see the accumulated results of his efforts. He certainly was an optimist; but would not the "City on the Hill" realize his dreams of the "Ideal College" which he described in his handbook of 1874? Said he: "In it, educational common sense would have supplanted uncommon educational nonsense. Such an agricultural college would be in keeping with its object, with the requirements and genius of labor, with itself. And, too, it would be in keeping with a rich, broad State, carpeted by emerald grasses, belted by golden grain, clumped with orchards, moving with herds, clustered with villages, threaded by railways, flecked with countless smoke offerings from the alters of industry to the God of labor. Some day; somewhere; somehow." J. D. WALTERS.

The Value of a Good Education.

The value of a thorough education fitting a young man for his life-work is no longer a debatable question. The recent report of the United States Bureau of Education shows that a boy with a common-school education has practically one chance in 9,000 of general recognition as a successful man in some department of human endeavor and usefulness. A high-school education increases his chances of such success by about twenty-two times, while a college education gives a young man about ten times the probability of success and advancement possessed by the high-school graduate, or about two hundred times the opportunity open to a boy with only a common-school education.—*The Scientific American*.

The new flight of cement steps built last week on the east side of the Auditorium greatly improves the walk. The work was done by Walters & McGregor, of Manhattan, and reflects credit on the contractors.

THE INDUSTRIALIST.

*Published weekly during the College year by the
Printing Department of the*

Kansas State Agricultural College.
Manhattan, Kansas.

PRES. E. R. NICHOLS.....Editor-in-Chief
PROF. J. D. WALTERS.....Local Editor
PROF. J. T. WILLARD.....Alumni Editor

BOARD OF REGENTS.

HON. J. W. BERRY ['83], Pres.....Jewell City
HON. J. O. TULLOSS ['99], Vice-Pres.....Sedan
HON. J. S. McDOWELL.....Smith Center
HON. E. T. FAIRCHILD.....Ellsworth
HON. A. M. STORY.....Manhattan
HON. GEO. P. GRIFFITH.....Hays City
PRES. E. R. NICHOLS, Sec. *ex-officio*, Manhattan

LOCAL NOTES.

President Nichols went to Topeka on Monday to look after the printing of the annual catalogue.

Assistant C. W. Melick and wife will be at home after August 1, in the Cortelyou house, on Humboldt street.

Prof. O. H. Halstead is teaching algebra, physics, physiology and Kansas history in the Riley County Normal Institute, now in session in Manhattan.

About seventy teachers are enrolled in the Riley County Normal Institute, and more are expected to do so. Over half of the number are former students of the College.

Prof. C. E. Paul, formerly of the Department of Mechanical Engineering at this College, arrived last week from Las Cruces, New Mexico, intending to be with us for a few days.

Coach Quigley, of St. Mary's, brought his College pennant winners to Manhattan last Monday and snatched a victory from the Agricultural College, the score being 2 to 1 in their favor.

Tickets for the senior class play, given in the Auditorium June 13 (see program), may be had at Willard's drug store, at 25 cents. All seats are good, but early ones may be better than late ones.

Assistant Hetty Evans, of the Department of Architecture and Drawing, gave a stereoptican lecture in chapel on Monday night, for the benefit of the College Y. W. C. A. Her subject was, "Some Great Paintings."

The American Union of Swedish singers meet in Chicago on July 20, 21 and 22. Three evening concerts will be given in the auditorium theater. Among the soloists will be Madam Helstrom, of the Royal Opera in Stockholm, Sweden, and Prof. Olof Valley, of this College. Mrs. Valley will accompany the professor to their old home city.

President and Mrs. Nichols entertained the College employees and their wives on Thursday night at their beautiful new home, "East Parkgate." There must have been over a hundred guests present, but the spacious parlors and the genial hosts were equal to the occasion. All present report a good time. Regent Story and wife were also present and enjoyed mingling with the large "College family."

Prof. J. D. Walters and Mrs. Walters will go to Boulder, Colo., on July 3, to attend the Colorado Chautauqua, where the professor will deliver a course of lectures on Architecture. The length of his stay in Boulder will depend on the building operations of the College—that is, he will return as soon as his services will be needed.

Professor Kammeyer will go to Dighton, Kan., on June 16, where he will address the public-school graduates of Lane County. On the following day he will address the teachers' institute, which is in session at the same place. He will preach the gospel of industrial training and present the merits of K. S. A. C. as a seat of learning.

At the Kansas State Experiment Station harvest began June 7. Several acres of winter barley were cut on that date. The varieties of barley grown were the Tennessee Winter and Semi-winter. The crop was excellent and the yield was estimated at forty bushels per acre. Several of the winter barleys appear to be hardy at this Station, and have outyielded the spring barleys from five to twenty bushels to the acre.

Last Thursday at 4 P. M. the artillery under General Hazen, by a clever ruse and a forced march, captured Evergreen Pass and proceeded to bombard the Armory under Major-General Barnes. The bombardment was continued until the stenographer came out and told him to stop, as they had broken two windows, jarred a bottle from a laboratory shelf, and shattered her nerves. The rout of the artillery was rendered complete upon the charge of forty-five cents for damage done of Colonel Coldwell.—*Students' Herald*.

The heavy rains of May 24 and 25 did considerable damage to listed corn and washed all cultivated fields badly. The level-planted corn again appears to have the advantage of the listed corn on the farm of the Kansas State Agricultural College. During the seasons of 1903 and 1904 level-planted corn yielded on the average eight bushels more per acre than listed corn. This data is probably not sufficient to warrant a system of level planting *vs.* lister planting, but it does show that in wet seasons the level planting is to be preferred.

The Faculty-senior ball game was pulled off Tuesday afternoon at Athletic Park and resulted in favor of the seniors by a score of 17 to 3. President Nichols was on the rubber for the Faculty the first inning, and was relieved by Professor Halstead, who held it down for five innings, Ahearn finishing the game. Professor Booth was behind the bat for the Faculty. The battery for the seniors was Evans, Cassell, and Thompson. The contest was very interesting for the first six innings, neither side scoring during the first four. At the end of the game the seniors had things pretty much their own way, making 11 scores in one inning.—*Daily Republic*.

Professor Willard will sail from Baltimore for Germany by North German Lloyd steamship Chemnitz June 21, and will spend most of the summer in that country, but may spend a few days in adjacent countries and in England. He will make a special study of experiment station work and methods of investigation, and of chemical instruction in the universities, and as far as possible visit chemical technological establishments. He will also attend the second International Congress of Agricultural Education, to be held at Liege, Belgium, July 28 and 29.

ALUMNI AND FORMER STUDENTS.

Rev. W. C. Howard, '77, of Newcastle, Cal., will spend Commencement week in Manhattan.

Fred. R. Jolly, '95, has started a paper in Paola which he calls the *Western Oil Record*. May his success be even better than his hopes!

Miss Marian Jones, '96, after a year at Teachers' College, Columbia University, has been employed as head of the domestic art department of the Manual Training School at Pittsburg, Kan.

S. R. Kimble, junior in 1901, is at home on a two-months' leave. He is master electrician in the artillery corps. He has recently taken the examination for appointment to a second lieutenancy.

W. P. Terrill, '04, has passed a successful year at the Massachusetts Institute of Technology and will spend the summer working at mechanical engineering in Boston, resuming his studies in the fall.

E. B. Purcell has received a letter from Lieut. Emory S. Adams ['98], of the Fourteenth Infantry, announcing his safe return from the Philippines to Vancouver barracks, at Vancouver, Wash. He describes the voyage home as being a delightful one, including stops at Nagasaki and Honolulu. This is Lieutenant Adams' third trip to the Philippines.—*Nationalist*.

H. M. Cottrell, '84, formerly professor of agriculture here, A. L. Cottrell, '03, and J. E. Dorman, third year in 1891, have organized the Cottrell Feed Company and have located at Elgin, Ill. Local capitalists are interested with them in the business, which will be the manufacture and sale of balanced rations for various classes of farm animals, using alfalfa meal as the foundation. Professor and Mrs. Cottrell had expected to attend the triennial reunion, but their new plans interfere with this. After July 1 they will be glad to have all old College friends drop in for a visit when they are in Chicago. They will be located only an hour and fifteen minutes from the business center of that city. He states that: "The alumni had a very pleasant meeting in Chicago, and there was a great deal of genuine enthusiasm shown for the College. I believe as these local alumni organizations grow older and stronger they will prove helpful to the College."

PROGRAM FOR COMMENCEMENT WEEK, 1905.

Friday, June 9

Societies' Commencement Lecture to Invited Guests, College Auditorium,
8 p. m., Dr. Montaville Flowers, President Flowers' Academy
of Speech and Dramatic Art, Cincinnati.

Sunday, June 11

Baccalaureate Sermon, College Auditorium, 4 p. m., Rev. T. H. McMichael,
President Monmouth College, Monmouth, Ill.

Monday, June 12

Recital by Music Department, College Auditorium, 8 p. m.

Tuesday, June 13

Examinations from 8:30 a. m. to 2:40 p. m.
Class-Day Exercises to Invited Guests, College Auditorium, 8 p. m.

Wednesday, June 14

Examinations from 8:30 a. m. to 11:50 a. m.
Reunion Literary Societies, 1:30 p. m.
Business Meeting Alumni Association, 3:30 p. m.
Reunion of classes, 4:30 p. m.
Triennial Alumni Address, College Auditorium, 8 p. m.
Prof. F. A. Waugh, Amherst, Mass.

Thursday, June 15

Annual Address, College Auditorium, 10 a. m., by Governor Hoch.
Presentation of Diplomas.
Cadet Band Concert, College Auditorium, 2 p. m.
Military Drill, 3 p. m.
Triennial Alumni Banquet, Women's Gymnasium, 7 p. m.

Swine Feeding Test with Sorghum-seed Meal, Kafir-corn Meal, Soy-bean Meal and Corn-meal.

Questions relative to the feeding value of sorghum seed and Kafir-corn are frequently received by the Experiment Station, Kansas State Agricultural College, and as an aid in answering these inquiries the following experiment was planned and carried out. Forty-eight pigs were divided into four lots of twelve pigs each. Each lot contained six Duroc-Jersey pigs, five Poland-China pigs, and one Tamworth. Their average weight at the beginning of the experiment was 138½ pounds, average age six months, and the length of experiment 28 days.

It will be noticed that Lots 1, 2, and 3 were fed rations in which the carbonaceous cereal grains were balanced by soy-beans, which are very rich in protein. Lot 4 was fed a purely carbonaceous ration, as a check, to show the value and need of a balanced ration. Pigs of this age are making considerable growth as well as fattening, and it would be expected that the balanced ration would give better results. Reference to the table shows such to be the case.

	Kind of Feed.	Pounds fed.	Value of feed.	Cost of 100 lbs. grain.	Total gain per lot,
Lot 1	{ Sorghum-seed meal Soy-bean meal.....	1612.8 403.2	\$9 67 5 04	\$4 26	345
Lot 2	{ Kafir-corn meal..... Soy-bean meal.....	1612.8 403.2	\$14 71 \$10 48 5 04	3 37	460
Lot 3	{ Corn-meal..... Soy-bean meal.....	1612.8 403.2	\$15 52 \$11 29 5 04	3 73	435
Lot 4	Corn-meal.....	2016.0	\$16 33 \$14 11	3 92	360

From the above table we note the value of Kafir-corn meal as a feed for pigs, this lot making better daily gains and also producing 100 pounds of gain from a smaller amount of grain than any of the other lots. A comparison of Lots 3 and 4 shows the value of the addition of soy-beans to the ration, 100 pounds of gain being produced for seventeen per cent less grain than with corn-meal alone. The sorghum seed produced rather poor results in comparison with the Kafir-corn meal and corn-meal in Lots 2 and 3. It took 33 per cent more grain to produce 100 pounds of gain with this lot than with Lot 2, and 26 per cent more than with Lot 3. However, 1.02 pounds daily for a period of twenty-eight days is a fair gain and in localities where there is a surplus of sorghum seed, for which there is no market, it can undoubtedly be fed to pigs at a profit.

Experiments are being conducted by the Farm Department of the Kansas State Agricultural College for the purpose of producing hardy winter varieties of Macaroni wheat and Emmer. Two varieties of Macaroni wheat lived through the winter of 1904-'05, and at this writing, June 9, this wheat is nearly mature, promising a heavy yield. The Emmer has not done so well, but sufficient seed will be secured to plant a considerable area next fall. Macaroni wheat is originally a spring wheat, and it has proved to be hardy and drouth-resistant when grown in the northwestern states, giving larger yields than the ordinary wheat. In Kansas spring wheat is not so well adapted for growing as winter wheat, hence the desirability of securing a winter variety of Macaroni wheat.

SAMPLE COPY.

VOL. 31

NO. 38

THE INDUSTRIALIST

ISSUED WEEKLY BY

KANSAS STATE
AGRICULTURAL COLLEGE

♦ ♦ ♦

Editor-in-Chief, - PRES. E. R. NICHOLS
Local Editor, - - PROF. J. D. WALTERS
Alumni Editor, - PROF. J. T. WILLARD

♦ ♦ ♦

Published by
PRINTING DEPARTMENT
J. D. RICKMAN, Supt.

♦ ♦ ♦

Entered at post-office, Manhattan, Kan., as
second-class matter. Act of July 16, 1894.

TERMS AND VACATIONS.

Fall Term, 1905, Thirteen Weeks.

WEDNESDAY, SEPTEMBER 20.—Examination for admission, at nine A. M.
THURSDAY, SEPTEMBER 21.—College year begins.
TUESDAY, OCTOBER 3.—Short course in domestic science begins.
SATURDAY, NOVEMBER 4.—Mid-term examination.
THURSDAY, NOVEMBER 30.—Thanksgiving Day vacation.
THURSDAY AND FRIDAY, DECEMBER 21, 22.—Examination at close of term.

Winter Term, 1906, Twelve Weeks.

TUESDAY, JANUARY 2.—Examination for admission, at nine A. M.
WEDNESDAY, JANUARY 3.—Winter term begins.
WEDNESDAY, JANUARY 3.—Short courses in agriculture and dairying begin.
SATURDAY, JANUARY 27.—Annual inter-society oratorical contest.
SATURDAY, FEBRUARY 10.—Mid-term examination.
THURSDAY AND FRIDAY, MARCH 22, 23.—Examination at close of term.

Spring Term, 1906, Eleven Weeks.

MONDAY, MARCH 26.—Examination for admission, at nine A. M.
TUESDAY, MARCH 27.—Spring term begins.
SATURDAY, MAY 5.—Mid-term examination.
TUESDAY AND WEDNESDAY, JUNE 12, 13.—Examination at close of year.
JUNE 10 TO 14.—Exercises of Commencement week.
THURSDAY, JUNE 14, at ten A. M.—Commencement.
JUNE 15 TO SEPTEMBER 19.—Summer vacation.

Fall Term, 1906.

WEDNESDAY, SEPTEMBER 19.—Examination for admission, at nine A. M.
THURSDAY, SEPTEMBER 20.—College year begins.

THE INDUSTRIALIST.

VOL. 31.

MANHATTAN, KAN., JULY 8, 1905.

No. 38

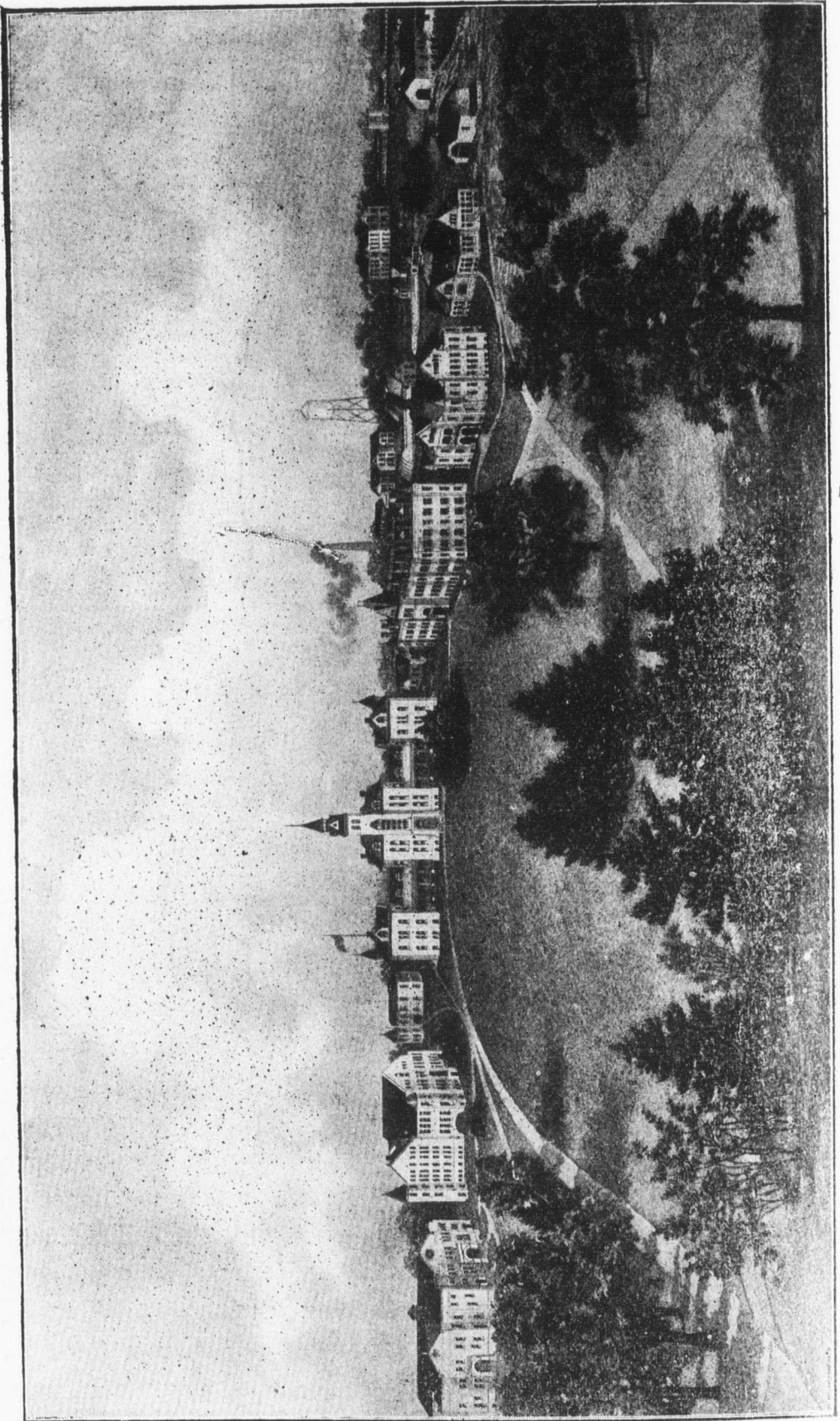
The Kansas State Agricultural College.

GROUNDS AND BUILDINGS.

THE College grounds and buildings, occupying an elevation at the western limits of the city of Manhattan, and facing toward the city, are beautiful in location. The grounds include an irregular plat in the midst of a fine farm, with orchard, vineyard and sample gardens attached, the whole being surrounded by durable stone walls. The grounds are tastefully laid out and extensively planted, according to the design of a professional landscape-gardener, while well-graveled drives and good walks lead to the various buildings. All these are of the famed Manhattan limestone, of simple but neat styles of architecture, and admirably suited to their use. All recitation-rooms are excellently lighted and ventilated, and are heated by steam or hot water. A complete system of sewerage has been provided. The College owns 430 acres of land, valued at \$50,000, and leases 150 acres additional. The greater portion of these 580 acres is devoted to experiments.

ANDERSON (MAIN) HALL is 152x250 feet in extreme dimensions, arranged in three distinct structures, with connecting corridors. This building contains, in its two stories and basement, offices of the President and Secretary, cloak-rooms, studies, chapel, post-office, and offices and class rooms of the departments of drawing, mathematics, economics English, philosophy, preparatory, and printing. Cost, \$79,000. The value of the equipment and apparatus in this building is as follows: Executive, \$6799; drawing, \$2361; mathematics, \$1581; economics and public speaking, \$57; English, \$84; preparatory, \$48; printing, \$5220.

MECHANICS HALL contains the following rooms, forming a connected structure: Wood shop, two stories, 40 x 103 feet. The upper floor contains office and drafting-room for the department of mechanical engineering. The lower floor contains benches for 220 students, and complete set of wood-working machinery and tools.



General View

Machine-shop, 40 x 80 feet; blacksmith shop, 40 x 50 feet; iron foundry, 40 x 50 feet; brass foundry, 16 x 30 feet, pipe-fitting room, 18 x 50 feet, engineering laboratory, 35 x 40 feet; power-room, 35 x 40 feet; boiler room, 40 x 75 feet. Cost of buildings, \$28,125; value of equipment: Mechanical engineering \$32,594; heat and power \$21,431.

GYMNASIUM, one story, 35 x 110 and 46 x 75 feet of floor space, is in the form of a cross. It contains a drill-room 46 x 75 feet, a large class room, cloak-room, dressing-room, toilet room, ten bath-rooms, and two offices. Cost, \$10,000. Value of equipment, \$620.

HORTICULTURAL HALL, 32 x 80 feet, is a one-story building with cellar, having museum, class room, and storage, with greenhouses attached. Cost of building was \$4200; value of equipment and apparatus is \$19,908.

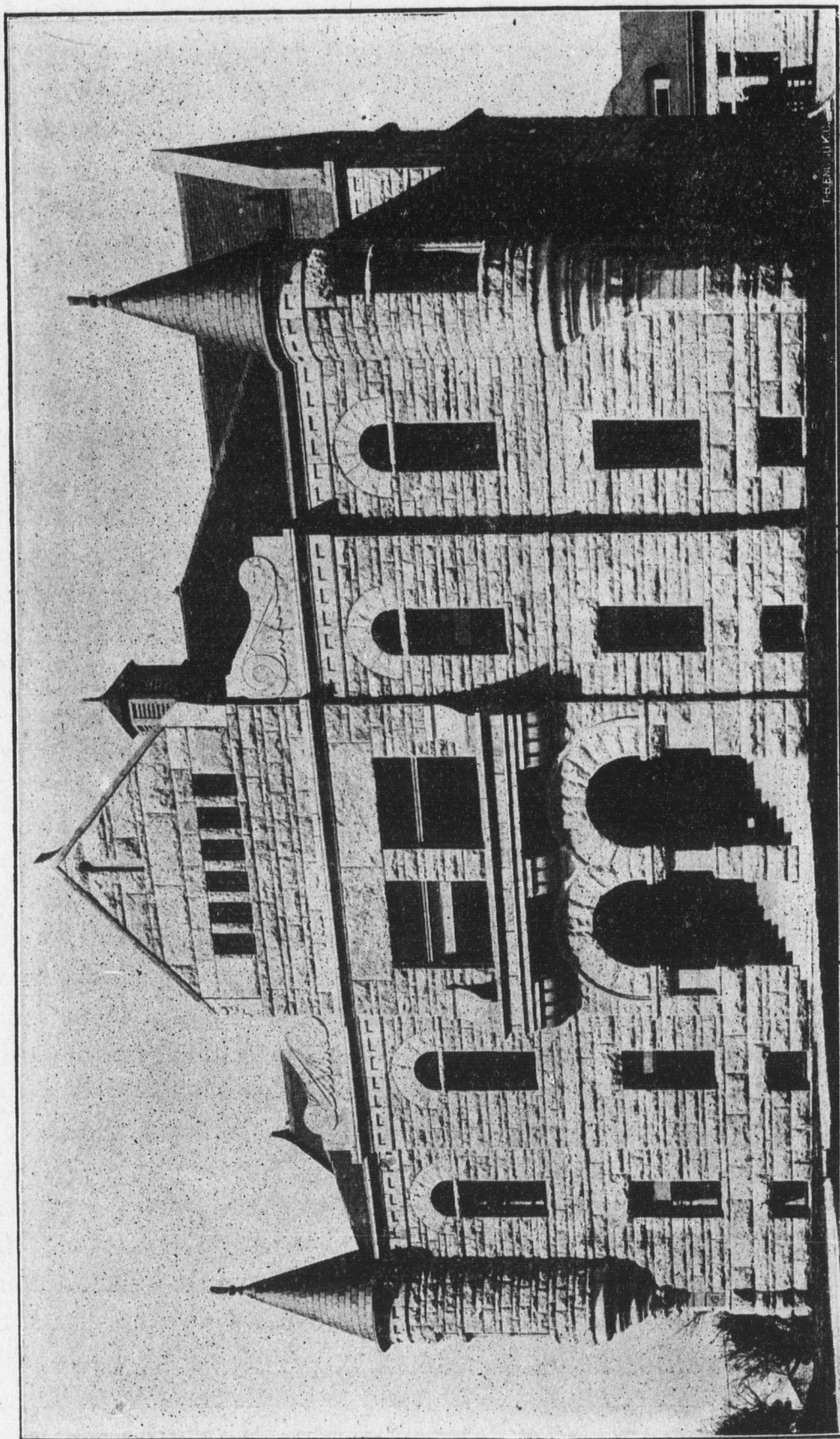
HORTICULTURAL LABORATORY contains offices, work room, five propagating houses, and insectary. Cost, \$5000.

ARMORY, 46 x 95 feet, is a two-story building. This building, which has served many purposes, is now fitted below for an armory and drill-room, and offices of the military department; also dressing-room and bath-room for the various athletic teams; and above are class rooms, laboratories, offices and museum of the veterinary department. Cost of building, \$11,250. Value of equipment and apparatus: Military, \$135; veterinary, \$6336.

FAIRCHILD (LIBRARY) HALL is 100 x 140 feet, three and four stories high. This building provides permanent quarters for the library, with ample reading-rooms and offices, class rooms and laboratories for the departments of botany, entomology and zoölogy, and bacteriology, a class room and office for the department of history and economics, general museum, and rooms for the various literary societies. Cost of building, \$67,750. Value of equipment and apparatus: Botany, \$15,083; history and civics, \$181; entomology and zoölogy, \$9580.

KEDZIE (DOMESTIC SCIENCE) HALL is 84 x 70 feet, two stories and basement. The first floor contains office, lecture-rooms and laboratories for the department of domestic science. The second floor is occupied by the department of domestic art. Cost of building, \$15,000. Value of apparatus: Domestic science, \$1960; domestic art, \$558.

AGRICULTURAL HALL, 90 x 95 feet, with its two stories and basement, contains offices, class rooms and laboratories for the depart-



Agricultural Hall.

ments of agriculture and animal husbandry. Cost of building, \$25,000. Value of equipment: Agriculture, \$3173; animal husbandry, \$24,611.

PHYSICAL SCIENCE HALL is 96x166 feet, and its two stories and basement contain offices, class rooms and laboratories for the departments of chemistry, and physics and electrical engineering. It is heated both by direct and indirect radiation, thus insuring perfect ventilation. Cost of building, \$70,000. Value of equipment: Chemistry, \$11,520; physics and electrical engineering, \$11,223.

AUDITORIUM is 113x125 feet, and has a seating capacity of 3000. Cost of building, \$40,000. The Auditorium also contains offices and music rooms of the music department, with equipment valued at \$2179.

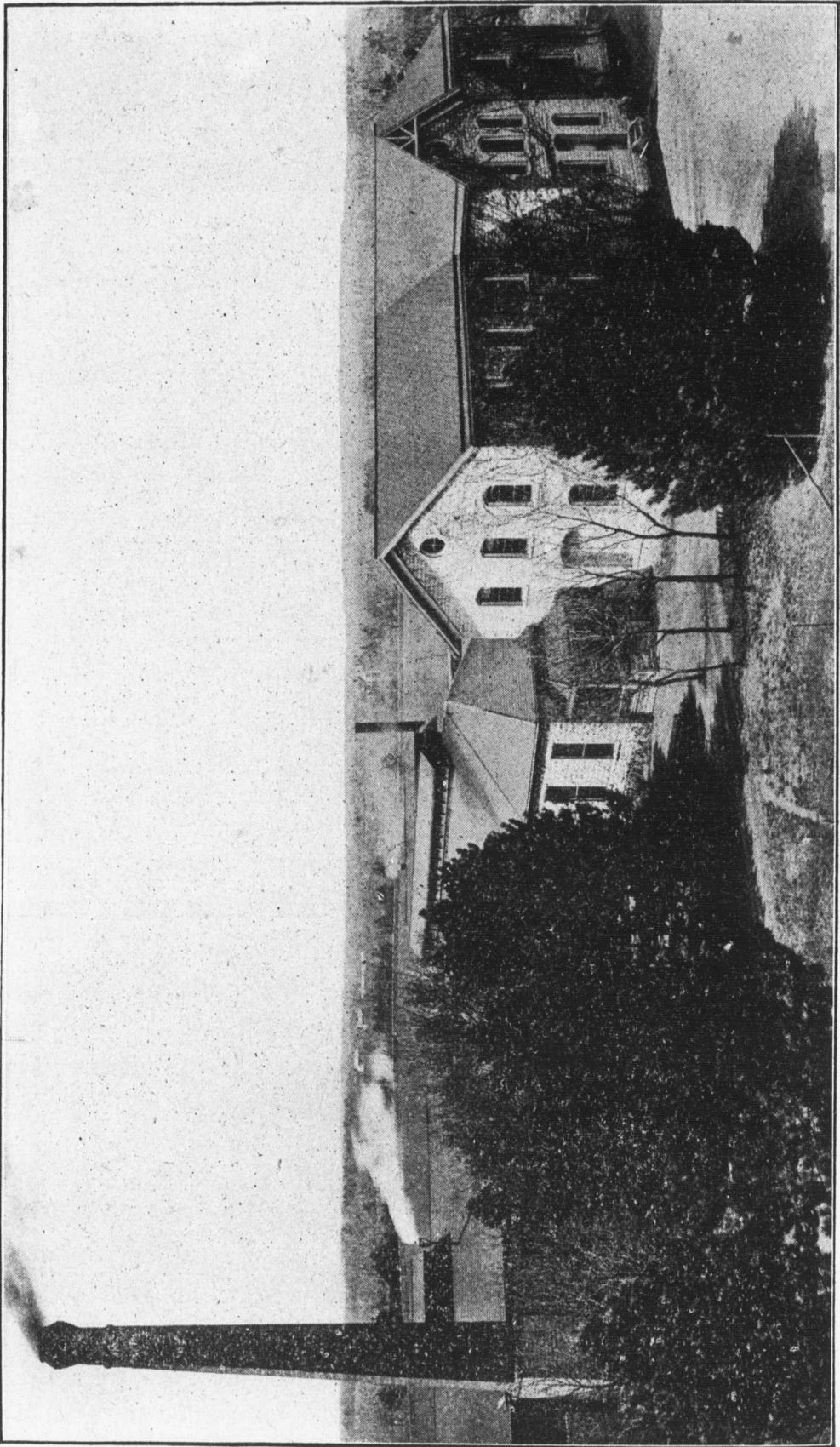
DAIRY HALL is 72x103 feet, one story and basement. It contains office, class room, butter-manufacturing room, cheese- and cheese-curing rooms, hand-separator room, laboratory, and refrigerator. Cost of building, \$15,000.

THE FARM BARN is a double but connected stone structure, 50 x 75 feet and 48x96 feet, with an addition of sheds and experimental pens 40x50 feet. The south wing, 48x96 feet, is the stock-judging room, having a seating capacity of 350. A basement underlies the entire structure. Cost, \$10,831.

THE DAIRY BARN, 40 x 175 feet, is fitted up with modern swinging stalls for eighty head of cows, arranged in two rows, with driveway between. Cost of building and equipment, \$4000.

THE HORTICULTURAL BARN is a stone building, containing store-room, granary, and stables for several horses. Cost, \$1000.

THE COLLEGE LIBRARY is one of the most important supplements to class-room instruction. It consists of 30,950 bound volumes and about 18,000 pamphlets. These books are mainly kept in a general library, but many volumes of technical character are withdrawn and held in departmental libraries. All of the books are indexed in card catalogues, which show their author, title, and to a large degree the details of their contents; also their location. Students are allowed free access to the shelves, a privilege and a source of culture that is given in perhaps no other library of its size in the country. Students may draw books for home use under simple and liberal regulations. The library is open daily, except on legal holidays, from seven A.M. to six P.M., and the



Mechanics' Hall.

librarian or an assistant is in constant attendance during this period to assist those who use the books. By all these means the library is used to the fullest extent and is of inestimable value.

The College subscribes for the leading literary, scientific and agricultural journals, while the principal daily and weekly papers of Kansas, and many from other states, are received in exchange for the College publications. All these are kept on file for the use of students and Faculty. The College has been designated as the depository of United States public documents for the fifth congressional district of Kansas, and 3580 volumes have already been received on this account. Value of books and equipment, \$61,011.

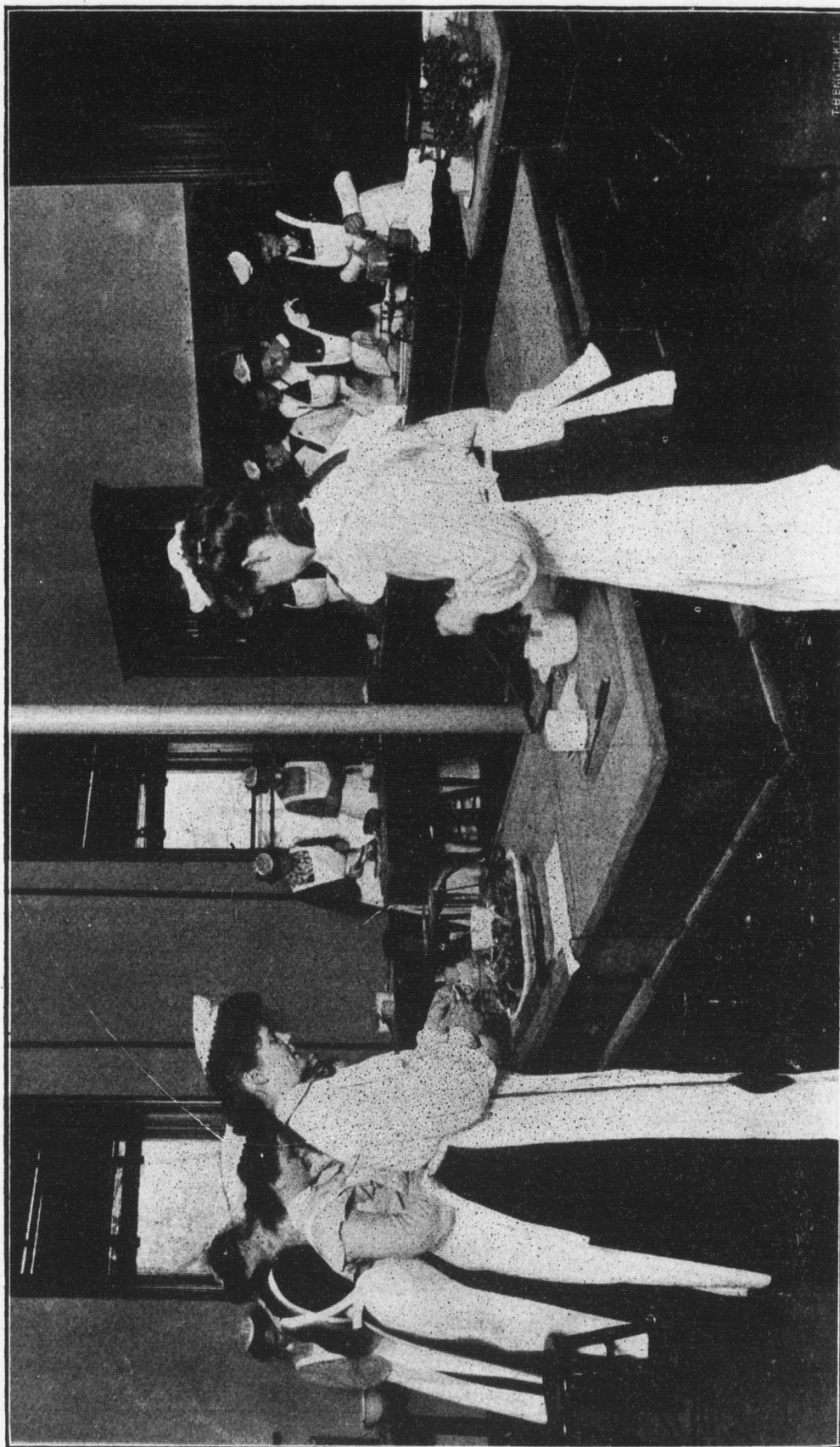
The total value of grounds, buildings and equipment is \$674,409. This is all available for the use of students and is being increased from year to year. This fall the College will begin the erection of a \$50,000 horticultural building and greenhouses.

THE VALUE OF A TECHNICAL EDUCATION.

In discussing the value of technical education, Mr. James M. Dodge, president of the American Society of Mechanical Engineers, says: "Obtaining data from which incontrovertible conclusions can be drawn is now comparatively easy, but a few years ago it was impossible. We are all prone to take extreme cases of success or failure as the basis for our opinions, and lose sight of the fact that it is the average man whose career shows the true force and direction of the current. For convenience of comparison I will outline the actual progress made by four groups of men working in the mechanic arts—the unskilled labor group, the shop-trained or apprentice group, the trade-school group, the technical-school group—and give results obtained." The following is a tabulation of his results, showing wages per week at different ages:

GROUPS.	Ages.			
	20	24	28	32
Unskilled labor.....	\$ 7 50	\$10 20	\$10 20	\$10 20
Shop trained.....	9 00	15 80	15 80	15 80
Trade school.....	14 00	20 20	23 50	24 00
Technical school.....	.....	18 00	36 00	43 00

"Thus we see clearly that preparation pays, and that it pays in dollars and cents, and that even a long term of years spent in



Class in Cooking.

FREDERICK

proper study and technical training is a good investment from every point of view." Most young men have a vague notion that an education will pay, but the temptation to earn money is too strong for many. The technical school puts off the earning period longest, and the young man at sixteen sees that even the unskilled laborer has a better immediate chance to earn money. The apprentice, a shop-trained laborer, seems to offer considerable advantage in the way of money earning. Not until the age of twenty-two and a half is reached does the technical graduate overtake the apprentice. The trade school offers still better opportunity for earning money. It is not till the age of twenty-five that the technical graduate overtakes the trade-school graduates. But the unskilled laborer reaches a maximum earning capacity at twenty-two, the shop-trained at twenty-four, the trade-school at thirty-one, and the technical graduate practically never reaches a maximum. His thorough training to use brain and brawn and books makes progress possible for many years.

Figures could be obtained that would show that an education pays equally as well in all other occupations. The farmer needs an education, has always needed an education, but needs it more to-day than ever before. A successful farmer is one who leaves the soil in as good, or better, condition than he found it. Measured by this definition, there are very few, if any, successful farmers.

Yes, farmers have made money, are making money to-day—most of them in spite of themselves. Nature is very lavish with her gifts. But the average yield of wheat and corn in bushels per acre in this country is ridiculously small—not more than one-half or one-third what it should be, and what it will be in a few years hence.

The farmer needs to know how to raise crops—paying crops—not one year, not ten years, but continuously. He must know how to keep up the fertility of the soil. The farmer is as interested in getting a fair price for the one blade of grass as he is in making two blades grow where one grew before; hence he should be an economist.

Fifty years ago machines were of the simplest kinds—the scythe, the sickle, and the flail. To-day we have the mowing machine, the self-binder, and the thrashing machine, besides many others, more or less complicated. The farmer needs to be a mechanic.

The farmer must market his product, must use the public highways. He needs to know how to make and maintain good roads. He needs a house for his family, and barns and sheds for his grain and stock. He should know rural engineering and architecture. There is frequently less thought put on the location and construction of the farm home than anything else about the farm. The farm home contains very few of the conveniences usually found in the city home; not because they could not be had, not because they are expensive, but because farmers and farmers' wives have not learned how to live comfortably or do not consider it necessary.

THE VALUE OF A GOOD EDUCATION.

The value of a thorough education fitting a young man for his life-work is no longer a debatable question. The recent report of the United States Bureau of Education shows that a boy with a common-school education has practically one chance in 9,000 of general recognition as a successful man in some department of human endeavor and usefulness. A high-school education increases his chances of such success by about twenty-two times, while a college education gives a young man about ten times the probability of success and advancement possessed by the high-school graduate, or about two hundred times the opportunity open to a boy with only a common-school education.

Would not you be willing to give \$600 and four years' time to have your earning capacity increased two hundred fold? Your enjoyment and ability to do good would be increased even to a greater extent.

COLLEGE DEPARTMENTS.

The College embraces the following departments: Executive, Agriculture, Botany, Chemistry, Dairy and Animal Husbandry, Entomology and Zoölogy including Geology, Horticulture, Veterinary Science including Bacteriology and Physiology, Architecture and Drawing, Domestic Art, Domestic Science, Economics including Public Speaking, English, German, Heat and Power, History and Civics, Library, Mathematics, Mechanical Engineering, Military Science, Music, Philosophy including Pedagogy, Physical Training, Physics and Electrical Engineering, Printing, and Preparatory. The heads of these departments constitute the Faculty,

and the heads of the first eight named are the Experiment Station Council, under whose direction the various experiments are undertaken.

There are in all about eighty-five employees. These are all thoroughly trained men and women, each specially selected for the work he is to do. The departments are all well equipped with apparatus and illustrative material.

PURPOSES OF THE AGRICULTURAL COLLEGE.

The purpose in founding the agricultural colleges is summed up in section four of the government act, a part of which reads as follows: "The interest of which shall be inviolably appropriated by each state which may take and claim the benefit of this act to the endowment, support and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic art, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." The distinctive feature of these colleges is to fit the men and women for the several industrial pursuits. All the courses are strong on the practical side, industrial training and laboratory work being prominent features throughout. Students usually have fifteen hours of recitations per week and ten hours of laboratory and industrial work. Students are thus continually kept in touch with work and are educated toward work rather than away from it.

TERMS OF ADMISSION.

Persons over fourteen years of age will be admitted in any of the following ways:

1. Kansas teacher's certificate, provided no subject is below seventy per cent.
2. Diploma received on completion of a county course of study.
3. Certificate of passing the grammar grade or diploma from the high school of any city or county.
4. Pass a satisfactory examination in the common-school branches—reading, spelling, writing, geography, arithmetic, United States history, English grammar, and physiology.

Persons over eighteen years of age will be admitted to the preparatory classes if unable to pass the common-school branches.

Full admission to the first year, in addition to the common-school branches enumerated in 4 above, requires bookkeeping, advanced English grammar, English readings, English composition, algebra through progressions, physical geography, elementary botany, ancient and medieval history.

It is quite possible for a good student who enters somewhat behind to make up his deficiency in a year or two and graduate in four years.

All of the preparatory and first-year studies are taught each term, and nearly all of the second-year subjects; so that a person may enter at the beginning of any term and find work suited to his advancement.

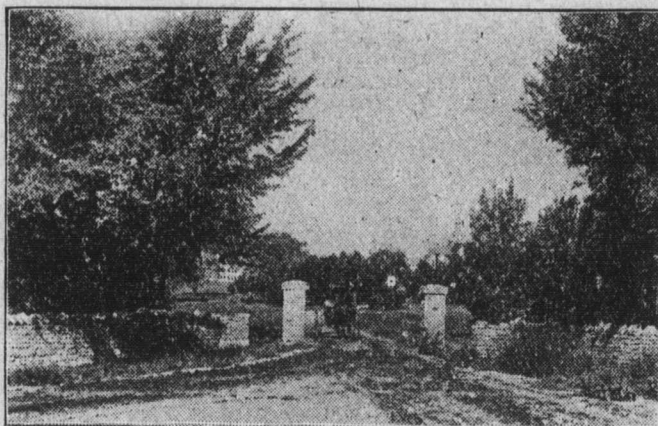
Examinations for admission are held at the beginning of each term. Applicants at other times during the school year have special examinations. These examinations are chiefly written, and a grade of seventy per cent, at least, must be obtained to pass a study.

EXPENSES.

Tuition is free. An incidental fee of \$3 per term will be charged all students from Kansas. Students from outside of Kansas will be charged an incidental fee of \$10 per term and an enrolment fee of \$10. Each student must present receipt for incidental fee before enrolment in classes. Rooms, board and washing are not furnished by the College. Board, with furnished room, can be procured in private families at from \$2.50 to \$3.50 per week, or table board in student clubs from \$2 to \$2.25 per week. Furnished rooms, without board, can be obtained at from \$3 to \$5 per month. Some students board themselves at even less cost, and rooms for the purpose can be obtained at a rent of from \$1 to \$3.50 per month. Washing costs from 50 cents to 75 cents per dozen. Books cost about \$3 per term. Young men of the freshman and sophomore years will be required to have military uniforms costing about \$12, and young women of the freshman year must have a physical-training suit costing about \$3. Ordinary expenditures, aside from clothing and traveling expenses, range from \$100 to \$200 per year. No institution in the State furnishes an education at less cost to the student.

THE
Kansas State Agricultural College
MANHATTAN, KANSAS

"In order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life," offers four-year courses in



Main Entrance to Grounds.

**Agriculture, Domestic Science, General Science,
Mechanical Engineering, Electrical
Engineering, Architecture,
Veterinary Science.**

Admission direct from country schools or eighth grade.

~~~~~  
It also offers to persons of mature  
age and limited means short courses in

**Agriculture, Dairying, and Domestic Science.**

~~~~~  
A Preparatory Department is maintained for students over eighteen.

A 200-page catalogue with 50 illustrations, containing full write-up of above courses and other valuable information, sent free.

~~~~~  
**ADDRESS**

**E. R. Nichols, President, - Box 25, - Manhattan, Kan.**